

1-1-2014

# Introduction of Drug Round Tabard and Checklist to Reduce Interruptions and Error in Medication Administration.

Blessing Uko-Udom  
*Royal College of Surgeons in Ireland*

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## Citation

Uko-Udom B. Introduction of Drug Round Tabard and Checklist to Reduce Interruptions and Error in Medication Administration. [MSc Thesis]. Dublin: Royal College of Surgeons in Ireland; 2014.

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# Introduction of Drug Round Tabard and Checklist to Reduce Interruptions and Error in Medication Administration

Blessing Uko-Udom

A Dissertation submitted in part fulfilment of the degree  
of MSc Healthcare Management, Institute of Leadership,  
Royal College of Surgeons in Ireland  
2014

# Introduction of Drug Round Tabard and Checklist to Reduce Interruptions and Error in Medication Administration

Blessing Uko-Udom

MSc in Healthcare Management 2012/2014

Student ID-08497869

Submission Date: 13th May 2014

Word Count: 16,028

Facilitator: Siobhan McCarthy

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## **Abstract**

Medication administration errors are common, costly and the cause of adverse events in clinical practice. Interruptions during medication administration rounds are thought to be a prominent causative factor of these errors. The change chosen for this project was the introduction of drug round tabards in a long term care facility for the elderly. The aim was to reduce non-urgent interruptions during drug rounds, reduce the incidents of medication errors, enhance patient safety, save time and promote compliance with professional and national standards on medication management. Disposable red tabards embroidered front and back with 'Drug round in progress, do not disturb' and checklist were introduced. The HSE change model was applied as a framework for the design and implementation of the change project. A total of 66(n=66) drug rounds- 33 pre-implementation and 33 post-implementation were observed for 2 weeks each. The sources of interruptions were recorded using the Medication Administration Distraction Observation Sheet (MADOS). Nurses' compliance to medication administration policy was evaluated using observational checklist that included 30 criteria. Medication administration errors were captured through direct observation and retrospective chart review. All staff were adequately trained, and nurses' satisfaction with the change project was measured in a survey. Quantitative evaluation method was used. There was an 85% decrease in interruptions (125 to 19), and larger decreases in medication errors (91%; 46 to 4) and non-compliance to policy (98%; 125 to 3). The average medication time saved was 9minutes. The result from the nurses' survey and verbal feedback on the project showed satisfaction with the use of drug round tabard and checklist. These results will be used as evidence to roll out these strategies to other units in the hospital.

## **Acknowledgements**

I am truly indebted and thankful to God for helping me through this academic pursuit. I would like to acknowledge and thank my organisation for giving me the permission and support to carry out this change project.

It is also my great pleasure to thank my colleagues for their participation and co-operation throughout the project period despite the challenging work conditions.

I am sincerely and heartily grateful to my facilitator, Siobhan McCarthy for her guidance throughout the project period. I would like to thank members of my Action Learning Set (ALS) for supporting me to develop action plans at every stage of the change project.

To the programme co-ordinator, Steve Pitman and all staff of RCSI Institute of Leadership, thank you for your inspiration and encouragement.

I wish to thank my family and friends for their regular reassurance.

Finally, to my husband, thank you for your understanding and inestimable support throughout this study period.

## **1.0 Introduction**

Patient safety is a key aspect in the care of the patient and one of the dimensions determining quality of care. Medication errors have been identified as the most common type of error regarding patient safety and the most common predictable cause of adverse events (National medicines Information Centre, 2001).

According to Agyemang and White (2002), distractions and interruptions are the most frequent causes of medication errors. Westbrook *et al.* (2010) also noted that the more a nurse is interrupted when conducting a drug round, the greater the number and severity of errors. Contributing factors to medication errors also include lack of focus and failure to follow standard operating procedures.

Although there are no standardised ways to reduce interruptions during drug rounds, Kreckler *et al.* (2008) suggest that nurses might wear some form of clothing during a drug round to indicate that they should not be interrupted. Although considerable research has been undertaken to quantify the volume and type of interruptions and distractions experienced on medication rounds, (Palese *et al.* 2009; Kreckler *et al.* 2009; Pape *et al.* 2005) to date there has been very limited evaluation of the strategies introduced to address these phenomena. The identification of interruptions and their reduction therefore constitute a good starting point for implementing quality improvements in the services offered to patients, who merit a competent nursing service as well as providing safeguards for professionals.

This chapter provides details about the organisation and the context of the change project undertaken by the writer. Then, the writer provides a rationale for carrying out the project and identifies the aims and objectives of the project. Following these, the role of the writer in the organisation and the project will be outlined and then conclusion.

## **1.1 Organisational Context**

The writer's healthcare facility is located in a suburb of West Dublin and has a total in-patient capacity of 270 beds. A team of doctors, nurses, care assistants and other members of the multidisciplinary team co-ordinate a range of services to meet the specific goals of individual patients.

The writer works in one of the units that provide long term care for the elderly with age related health problems such as cognitive impairment, dementia, etc. This project will be limited to this 22-bed unit but with the aim of rolling out to the other units after a successful outcome.

Basically, nursing staff carry out medication rounds in the unit by 8 am, 4pm and 10pm except for a few that are given at 6 am and 12 noon. In an effort to maintain these medication administration schedules, nurses are often hurried, distracted and interrupted during critical steps in the process. Also, simply because nurses are standing still in front of a medicine trolley, they fall prey to being interrupted. There is a large volume of evidence from other high – risk industries in particular aviation, demonstrating that interruptions and distractions increase error and accident rate (Healey *et al.* 2006).

## **1.2 Nature of the Change**

The change initiative was the implementation and evaluation of a quality and safety initiative in a long term care facility for the elderly. The project was introduction of drug round tabard and checklist to facilitate medication administration process, thereby reducing errors.

There were a number of key components to this change project. A detailed literature review was conducted to ensure that all relevant publications were accessed. This was followed by disseminating the context of this project to all stakeholders that will be affected by the change. Then the project team was formed and training sessions provided for the participating staff. A baseline audit was performed through observation of drug rounds and pre-implementation data collected. The wearing of disposable drug round tabard with inscription on front and back “DRUG ROUND IN PROGRESS, DO NOT DISTURB” and checklist were introduced.

Post-implementation data was collected using the same tools and method as in pre implementation after 3weeks. Additionally, questionnaire was administered to participating nurses and oral feedback obtained to assess their satisfaction on the project. The HSE change model was used as a framework and quantitative evaluation method used for this project. The ultimate goal of the project was to improve quality of medication administration and also enhance patient safety.

### **1.3 Rationale for the Project.**

In Ireland, managing medication is a regulated activity under the Health Act (2007) and all registered nurses have a duty to protect the residents against risks associated with management of medication (HIQA, 2009).

In the writer's organisation, there were a total of 53 incidences of medication errors between January and December 2013. These included: prescribing(11); transmission(11);labelling(4);dispensing(1);distribution(5);storage(8);administration(11) and documentation(2).

Also, in a recent medication audit carried out in the writer's unit, the result revealed some medication administration errors, such as omission, failure to sign, wrong administration techniques and poor documentation. Also observed were non – compliance to the medication administration policy and distractions throughout the process.

Nurse colleagues attributed these to interruptions during drug rounds and admitted that even a momentary break in concentration can lead to mistake. They voiced out this problem and were looking for ways to change this practice in order to meet with the recommended standard for medication administration. It is therefore a logical strategy to attempt to reduce the risk of medication errors and improve compliance by minimising unnecessary interruptions and distractions to nursing staff during drug rounds.

Reports from authorities such as the UK National Service (NHS, 2007) and the US Institute of Medicine (IOM,2003) have advocated the wearing of visual signals during the medication round in the form of brightly coloured tabards, vests or sashes, to alert staff to the fact that nurses should not be interrupted. The literature shows that hospitals in a number of countries have adopted this practice and have proved successful in reducing interruptions and distractions during drug rounds. Geller (2000) point out that symbols and signage are influential in our society, signs can serve as warnings of impending danger before the fact and can be used as safety reminders to direct behaviour.

## **1.4 Aims and Objectives**

- The overall aim was to reduce non-urgent nurse interruptions and distractions during medication rounds thus reducing medication errors, improving compliance and enhancing patient safety.
- To minimise time taken to complete drug rounds, therefore realising more time allocated to patient care.

### **Objectives**

- To commence the use of drug round tabard with inscription on front and back, “DRUG ROUND IN PROGRESS, DO NOT DISTURB” during drug administration by 2<sup>nd</sup> December 2013.
- To reduce unnecessary interruptions and distractions during medication administration from 10% to 2% by 21<sup>st</sup> February, 2014.
- To comply with the Health Information and Quality Authority (HIQA) standard of medication administration.
- To assess the satisfaction of all nursing staff using drug round tabard with regards to safety, compliance and efficiency in medication administration by 1st March, 2014
- To reduce medication administration errors in the unit from 5% to 1% by 14th April, 2014.

## **1.5 Role of the Writer in the Organisation and the Project**

The writer who is a staff nurse worked in collaboration with the unit nurses, the medication management committee representative, patient representative and patient relative representative as a team to carry out this project.

The writer provided informal information sessions to nurse colleagues, trained and guided staff to complete data collection forms. The writer was also involved in monitoring drug rounds, pre and post implementation of drug round tabards. The writer analysed data collected to determine whether introducing drug round tabards reduced the number of interruptions, improved compliance thereby improving patient care and safety.

## **1.6 Conclusion**

Patient safety and quality of care are essential aspects of clinical nursing practice. When people are admitted to hospital, they expect to have their illness or disease treated, and to receive quality nursing care. They do not expect to be harmed but unfortunately, patients are frequently harmed or injured by medication errors whereas the primary goal of nursing care is to maximize health and wellbeing, and so optimize the quality of peoples' lives (Wilson, 2009).

This dissertation will look at the evidence base in the literature for carrying out such a change process and it will describe the project in its different phases with reference to the HSE change model (2008) and to other theories of change management. Furthermore, the dissertation will set out the findings from an evaluation of the project and finally it will discuss the key themes identified and make recommendations.

## **2.0 Literature Review**

### **2.1 Introduction**

Medication administration errors represent one of the major concerns in patient safety. Interruptions and failure to follow a standard process have been cited to be important contributors to these errors. Successful strategies used by other industries for reducing errors have also been recommended for healthcare. The aim of this review was to find evidence to support the use of drug round tabard and checklist to reduce the risk of medication errors by minimizing unnecessary interruptions and distractions to the nursing staff during medication administration.

Based on a review of the literature, medication administration and guidelines will be discussed. After that, risk factors for medication administration errors will be explored then the impacts of interruptions and distractions on medication administration will be examined. Following this, strategies to reduce interruptions and medication errors will be discussed and then conclusion.

The literature review for this project resulted from searching the Royal College of Surgeons in Ireland (RCSI) Library databases of Cumulative Index of Nursing and Allied Health Literature (CINAHL), EBSCO host, Medline, Ovid, Science Direct, Wiley and Emerald. Other resources used include, Google, Google Scholar, and Medscape. A hand search of bibliographic references of relevant articles and existing review was conducted to identify studies not captured in the electronic data base search.

The following Search terms were used, interruptions, distractions, medication errors, quality improvement, patient safety, medication administration, drug round tabard. Terms were combined with the word nurses, thereby narrowing the search. Articles from the past five years were included, but several articles older than five years were also included due to their historical relevance.



## **2.2 Medication Administration and Guidelines**

Medication administration is a complex process involving a myriad of individuals in an increasingly fast-paced and fragmented healthcare environment. Nurses are primarily involved in the administration of medications across settings and can also be involved in both the dispensing and preparation of medications (in a similar role to pharmacists), such as crushing pills and drawing up a measured amount for injection. This section discusses several sources of guidance on medication administration for nurses, those from research, evidence based guidelines and regulatory institutions.

The complexity of the medication process has led to the formulation of the rights of nurses in the area of medication administration. In Ireland, An Bord Altranais (ABA) (2007) has prepared guidelines to assist nurses and midwives to understand their roles and responsibilities in medication management. They are written to enable nurses and midwives to reflect on the key points associated with medication management and the related principles, and thus support effective, safe and ethical practice. Accordingly, the 5 “rights” of medication administration considered in the guiding principles include; the right medication; the right patient/ service user; the right dosage; the right route and the right time (ABA, 2007).

On the contrary, Cox (2000) noted that quality in medication administration is not simply a matter of adhering to these five rights, because in recent years, seven rights (the five rights plus right response and documentation) have been proposed, but errors still occur. Therefore, to decrease the incidence of medication errors even further, Elliot & Liu (2010) proposed the nine rights of medication administration to include the seven rights plus right form and right action.

Indeed, Massachusetts Nurses Association, MNA (2006) provide an excellent discourse and added the essential environmental conditions conducive to safe medication practices to include (a) the right to complete and clearly written orders that clearly specify the drug, dose, route and frequency; (b) the right to have the correct drug route and dose dispensed from pharmacies; (c) the right to have access to drug information; (d) the right to have policies on safe medication administration; (e) the right to administer medications safely and to identify problems in the system; and (f) the right to stop, think and be vigilant when administering medications.

Additionally, Nursing and Midwifery Council (NMC) guidelines states that nurses must provide a high standard of practice and care at all times (NMC, 2008) and are accountable for ascertaining the identity of the patient to whom medicine is to be administered; they must check that the patient is not allergic to the medicine before administering it, and they must make a clear, accurate and immediate record of all medicine administered, intentionally withheld or refused (NMC, 2007).

In Ireland, the National Quality Standards for Residential Care settings for Older People (HIQA, 2008) have been developed based on legislation, standards in other jurisdictions, research findings and best practice. Each resident is protected by the residential care setting's policies and procedures for medication management based on these standards.

In order to meet with these required standards, the medication management policy in the writer's area of practice has stated its commitment to medication management so that the most appropriate, safe and effective medicines are correctly sourced and used in order to achieve optimal health benefits and economic objectives within the national legislative framework. The purpose of this policy is to ensure that each team member who has a role in assessing the patient and /or prescribing, ordering, dispensing, delivering or collecting, storing, administering or reviewing of medicines, foods for special medical purposes, unlicensed medicines and complimentary medicines fulfils their role to the highest possible standard.

The results from all these findings from the literature could further be adopted to make guidelines of medication administration more practical for the clinical nurses to adhere.

### **2.3 Risk Factors for Medication Administration Errors**

Medication administration involves a complex set of steps in achieving the desired goal of getting the medication to the patient in a timely manner. A multitude of contributing factors often lead to medication errors as nurses encounter constraints within the system work design problems, human and environmental factors (Pape,2003). This section discusses medication errors but with emphasis on risk factors for medication administration errors, as nurses have the primary role in safe administration of medications.

The National Medicines Information Centre (2001) define medication errors as preventable events that may cause or lead to inappropriate medication use or patient/ service- user harm while the medication is in the control of the health care professional, patient/service user. They also postulate that medication error is the most common type of error affecting patient/service user safety and is the most common single preventable cause of adverse events.

In Ireland data on medication error and adverse drug reactions in four hospitals recorded 510 events / near misses in a three- month period (Kirke *et al.*2007). The most common event / miss types were wrong dose, frequency/rate and dose/drug omission, with monitoring, omission and wrong frequency /rate being the most common categories for average drug events i.e. resulting in patient harm. Seven per cent of the reports involved patient harm due to adverse drug reactions or medication error (DOHC, 2008).

Barker *et al.* (2002) found that medication errors occur in approximately one out of every five doses in a typical hospital while Scott (2002) reported a 500% rise in drug errors over the previous decade adding that this led to approximately 1200 deaths in England and Wales in 2001. Fijn *et al.* (2002) explain that drug administration is predominantly a nursing responsibility which is only one part of the medication management process and as such, error may occur as a consequence of errors in other aspects of the medication process such as selection, procurement, and storage, prescribing, ordering and transcribing.

Alternatively, they may occur as a consequence of or be influenced by individual or systems issues including the type of drug administration system, the quality of the prescription (Kelly, 2004; Kazaoka *et al.* 2007), deviations from procedures (Han *et al.* 2005), workloads, staffing and shift patterns (Kelly, 2004; Tang *et al.* 2007) and knowledge and mathematical skills of nurses (Polifroni *et al.* 2003, Eisenhauer *et al.* 2007). Therefore, Chua *et al.* (2009) describe a drug administration error as a discrepancy between the drug therapy received by the patient and that intended by the prescriber or according to standard hospital policies and procedures. They also further classified drug administration errors into 11 categories: incorrect time, incorrect administration technique, unauthorised or unordered drug, incorrect drug preparation, incorrect dose, omission, incorrect rate, incorrect drug, deteriorated drug, extra dose and other errors which are not specified.

Subsequently, Barker *et al.* (2002) argue that the worldwide incidence of medication administration errors varies between 6.6% and 44.6% for all doses administered by nurses. Flynn *et al.* (2002) supported that the proportion of these errors with the potential to harm patients, such as permanent disability and death, is estimated at 7%. Taxis & Barber (2003a) found drug errors occurring in 49% of drug administration procedures.

These findings from a medication safety perspective show that the medication administration stage is different from other stages of medication management process. Leape *et al.* (1998) and Aspden, (2007) suggested two reasons which include; first, that nurses act as safeguard against errors intercepting up to 86% of all errors made by physicians, pharmacists, and others involved in providing medications for patients. Second, medication administration has very few safeguards against errors because it happens at the end of the medication use process.

For these and other reasons, it is imperative that improvements to the medication administration process could tremendously maximise medication use safety within healthcare organisations.

## **2.4 The Impacts of Interruptions and Distractions on Medication Administration**

An interruption is an attention- getting situation that changes the course of the task (someone interrupts, medication is missing). A distraction is an event that attracts the person's attention away or interrupts the thought processes (noises, conversation) or distractions include anything that draws away, diverts, or disturbs attention from achieving a goal (Pape, 2002). This section explains the impacts of interruptions on the process of medication administration.

When nurses are surveyed, work interruptions appear among the most prominent of the system- related factors (Cohen *et al.* 2003, Balas *et al.* 2004, Stratton *et al.* 2004, Armutlu *et al.* 2008). Studies have demonstrated that interruptions to the workflow of healthcare professionals are very common (Healey *et al.* 2006) and in hospitals a highly interruptive environment is generally accepted as the norm (Beyea, 2007).

### **2.4.1 Interruption a Causal Factor for Error?**

In exploring these concepts further, Pape (2013) explain that the potential for slips and mistakes is a function of the internal environment, whereas distractions, interruptions, communication problems, time pressure, and noise are functions of the external environment. Adding that, when the two combine, errors are more likely to occur which is why it is important to consider both inherent human influences and external pressure.

In their opinion, Hopp *et al.* ( 2005) argue that work interruptions entail a halt of the activity being performed for monitoring purposes or to carry out a secondary task. Whereas, distractions on the other hand are detected by a different sensory channel from those of the primary task, and may be ignored or processed concurrently with the primary task. However, McFarlane & Latorella,( 2002 ) pointed out that both concepts are related as distractions are the necessary precursor of work interruptions.

Biron *et al.* (2009) also noted that the risks of medication administration errors are found to increase by 60 % if a nurse is interrupted during the preparation phase. They argued that medication preparation seems a critical step in medication administration in preventing medication administration errors. They also noted that medication preparation requires that information found in the medication administration record be matched with the information provided by the medication distribution system.

A study on medication administration safety carried out by Hughes & Blegen (2007) found out that factors such as distractions and interruptions, during the process of delivering care can have a significant impact on medication safety. Nine studies, four with nationwide samples and two literature reviews present information on the association between administration errors and distraction and interruptions.

### **2.4.2 Does Interruption Cause Adverse Patient Outcomes?**

In the landmark report 'To err is human', the Institute of Medicine (2000) was among the first to suggest that interruptions could contribute to medical errors. Pape (2003) added that in general, interruptions are recognised as conditions that reduce efficiency and productivity and contribute to errors in clinical practice.

In their study, Westbrook *et al.* (2010) found that each interruption was associated with a 12.1 % increase in procedural failures and a 12.7% increase in clinical errors. They also found that a high percentage of interruption (22%) occurred in medication rooms during preparation (Potter *et al.* 2005). One survey of nurses in three hospitals in Taiwan perceived distractions and interruptions as causes of errors (Tang *et al.* 2007). In three other studies in the United States, nurses ranked distractions as major causes for the majority of medication errors (Stratton *et al.* 2004, Mayo & Duncan, 2004, Ulanimo *et al.* 2007).

In a small, five-site Observational Study of medication administration, Scott-Cawiezell *et al.* (2007) found an increase in medication errors attributable in part to interruptions, and when wrong time errors were excluded, the error rate actually increased during medication administration. These findings are furthered by research concerning self-reported errors from a nationwide sample of nurses (Balas *et al.* 2006). The nurses believed the cause of their reported medication errors and near errors were interruptions and distractions.

Furthermore, in a secondary analysis of the MEDMARX data base, distractions and interruptions were prominent contributing factors to medication errors (Beyea *et al.* 2003, Hicks *et al.* 2004).

However, with the exception of the area of dispensing of medications, there is yet little evidence directly linking interruptions to medication errors and adverse patient outcomes. In a 2009 review of interruptions in health care, Grundgeiger (2009) observed that this lack of evidence is in part due to the use of research methods unsuited to detecting the association between interruptions and medication errors. In addition, when nurses are hurried and distracted, they can easily mistake one medication for another one because they do not really see the words on a medication label (Hicks, *et al.* 2008; Pape 2006).

Today, the effects of these human factor issues on nurses' medications delivery have become more important, so avoiding distractions and interruptions as much as possible when preparing and administering medications is critical in today's healthcare environment. These findings also suggest that interventions are needed to eliminate or reduce interruptions that occur during the medication preparation and administration process.

## 2.5 Strategies to Reduce Interruptions and Medication Errors

Evidence exists to support the use of specific strategies or processes to reduce the incidence of medication errors, and measures to counter errors are developed from the idea that although human condition cannot be changed, the work system can be redesigned to help humans avoid errors. This section discusses various evidence based strategies applied to reduce drug round interruptions and medication administration errors.

Reason (2000) suggest that when the system fails to prevent an error, the focus should not be on who made a mistake, but on how and why the defences failed. Leape *et al.* (1998) also acknowledges that system redesign is a critical component of future healthcare safety in creating a culture where prevention is everyone's responsibility. Levine *et al.* (2001) suggested that medication administration errors can be prevented through adherence to the 'Five Rights' of medication safety and the medication error preventive guidelines. They observed that the principle of right patient, drug, dose, route and time when administering drugs is emphasised in nursing guidelines. Tang *et al.* (2007) concur that an understanding of why nurses violate the five rights and make mistakes is central to efforts to reduce medication errors.

Considering other strategies, Cummings *et al.* (2005) reported that errors involving administration of the wrong medication or to the wrong patient were reduced by 60% after the implementation of barcodes to match each patient's electronic order and other medical information. In addition to these electronically based strategies, the use of satellite pharmacies and unit-based pharmacists improved safety by reducing floor stock, a potential source of medication error (Kane-Gill & Weber, 2006).

In addition, Anthony *et al.* (2010) adopted the 'No Interruption Zone' (NIZ) recommended as a strategy by the Institute for Safe Medicated Practices, a non-profit North American Organization dedicated to the prevention of medication errors. The NIZ is fashioned after the aviation industry's "Sterile Cockpit Rule". The Federal Aviation Administration in 1981 enacted policies that prohibit non-essential tasks and communications by aircraft personnel during flight operations below 10,000 feet, where the activities of take-off and landing are complex and must occur within a short period (Pape, 2003).

Distractions and interruptions resulting in omissions or inappropriate actions during flight operations accounted for 72% of 76 reported airline incidents (FSFALAR, 2000). This adherence to the Sterile Cockpit rule minimizes distractions during critical periods of flight operations and improves airline safety. Therefore, in various quantity improvement projects the NIZ has been adapted to the hospital setting. Pape (2003) also endorses the application of airline safety practices to medication administration, requiring nurses to treat this role with the gravity that it merits by adhering stringently and solely to the task at hand, utilising a strict medication safety checklist with visual reminders for accuracy to enhance the safe execution of this role.

Staff member education is also widely recognised as an effective strategy to reduce interruptions during medication administration (Pape, 2003, Kilger *et al.* 2009, Relihan *et al.* 2010). Pape *et al.* (2005) support this type of approach and advocate that members of the healthcare team, patients and visitors should be educated regarding the importance of not distracting nurses engaging in medication rounds.

Furthermore, some organizational actions are recognised as effective in the containment of interruptions. Bennett *et al.* (2006) suggested that creating a dedicated room for medication preparation reduces the occurrence of interruptions. The wearing of a tabard by the nurse managing the round reminds the team not to disturb him/her, and is also considered effective in preventing interruptions (Pape, 2003, Pape *et al.* 2005, Relihan *et al.* 2010, Scott *et al.* 2010).

To enforce these approaches, Kreckler *et al.* (2008) suggest that the nurse undertaking the drug round must also avoid unnecessary conversation with patients or colleagues and refuse to be taken away from the drug round to attend to other nursing responsibilities. Pape (2003) remarked that although hospitals in a number of countries have adopted these practices, only one published study has assessed the magnitude and statistical significance of the impact of an initiative introduced to reduce interruptions and distractions during the medication round.

The above discussion show that having a way of thinking that supports continuous adjustments can improve systems before they break down and result in catastrophic events. Therefore, high reliability theory suggests that organizations focus on identifying where and how mistakes can be made and then implement responses



accordingly (Cohen, 2013). It is also important that nurses consciously take up the challenge of addressing important practice issues and energetically contribute to change such as the introduction of drug round tabard and checklist to reduce interruptions thereby facilitating medication administration process.

## **2.6 Conclusion**

This chapter has provided a critical discussion of the key issues surrounding safe medication administration and factors contributing to medication errors. The literature review identified interruptions and distractions in the work environment as contributing significantly to medication administration errors. Various strategies to reduce these interruptions thereby reducing medication errors have also been suggested.

A system approach posits that, although individuals are responsible for the quality of their work, more medication administration errors can be avoided by focussing on the system rather than solely on individuals. The general finality of this literature review is to contribute to enhancing available knowledge of the effectiveness of drug round tabard and checklist as strategies in reducing interruptions of the nurses' medication round. The next chapter will discuss the change process.

### **3.0 Methodology**

#### **3.1 Introduction**

One of the key concerns in health care is management of change and healthcare professionals are obligated both to acquire and to maintain the expertise needed to undertake their professional tasks, and only those tasks that are within their competence (Al-bri & Al-Hashmi, 2007).

Change is an on-going and never ending process of organizational life, and organizations are also changing the way they implement and manage change. Change management in many organizations has shifted from being the responsibility of an internal or external change agent dedicated to its implementation and management to increasingly being identified as a core competency for most organizational leaders (Doyle, 2002). As such, the skills required to lead, manage and implement change are being incorporated into the existing expectations, roles and responsibilities of managers and other employees. This chapter will critically discuss different models of change, thereafter outline the change model chosen and describe its application to the project concerned.

#### **3.2 Different Change Models**

Lorenzi *et al.* (2004) postulate that healthcare organizations are constantly trying to reassess their future direction and there is no single model that can be used in every situation. They suggest that the change management leader should take time to know the desired and the organization's current situation and then develop an appropriate model to help facilitate achievement of the desired state. This section critically discusses different change management approaches and their applications.

According to Burnes (2004a), different theories underpinning the change models make it challenging to compare and contrast them as they are derived from different philosophical stand points. Hence, Shanley (2007) suggest that understanding the type of change is required as this will facilitate selection of the most appropriate model. In a study of organizational change management theories, Young (2009) argued that most change models might be helpful in guiding change implementation but in terms of simplicity and clarity, few practitioners and managers understand or manage to follow the basic principles surrounding the change process. Therefore he

proposed a meta model of change which includes, existing or pre-change paradigm, a stimulus, consideration, validating the need, preparation, commitment to act, the transition (do-check-study), specific reset and the ending benefit (new model).

Moreover, the literature identifies a variety of different approaches which include: planned approaches such as Lewin's model and Kotter's model (Burnes, 2004b), emergent approaches, (Pettigrew, 1990), prescriptive approaches (Kotter, 1996b), social cognitive theory approaches (Bandura, 1988), behavioural approaches (Ajzen 1991; Ajzen & Madden, 1986; Prochaska & Di Clemente, 1984) and bottom or top down approaches (Shanley, 2007).

Although the work of Lewin (1951) conceptualized change as a three stage process of unfreeze, change and refreeze, this model can be applied to almost all change situations in order to analyse the success and failure of the whole process (Bar and Dowding, 2008). Kotter's eight-step change model (1996) for transforming organization calls attention to the key phases in the change process. This model points out that it is the manner in which change is driven that is important. Utilising Kotter's approach, the need to impress upon staff of the need to move out of their 'Comfort Zone' and getting the right balance of people together on the team to move the change forward is vital.

Similar to Lewin (1951), communication is seen as everything, and Kotter emphasises that every means possible should be used to constantly communicate the new vision and support the strategy. These are then followed by the introduction and rooting of new practices such as empowering the staff to help change happen by removing obstacles, generating some benefits in the short term, consolidating short gains and embedding the new approaches into the organizations culture. Both Lewin (1951) and Kotter's (1996) models are linear in their approach which could be viewed as a criticism where change may be viewed as a relatively straight forward process (Higgs and Rowland, 2005) whereas it is far more complex.

These planned approaches have been criticised for being too linear, whereas the reality is that change is cyclical with individuals moving backwards and forwards along the change continuum until the change is fully embedded in the organization (Demers, 2007). Another criticism of planned approaches is that they have ignored the role of power and politics in organizational change (Shanley, 2007).

Some change models propose following linear steps and progression is inevitable whereas organizational change is never linear and usually filled with unforeseen circumstances. Prescriptive models are also noted to be linear as they do not allow for individual interpretation of the steps required for achieving change (Kristsonis, 2005).

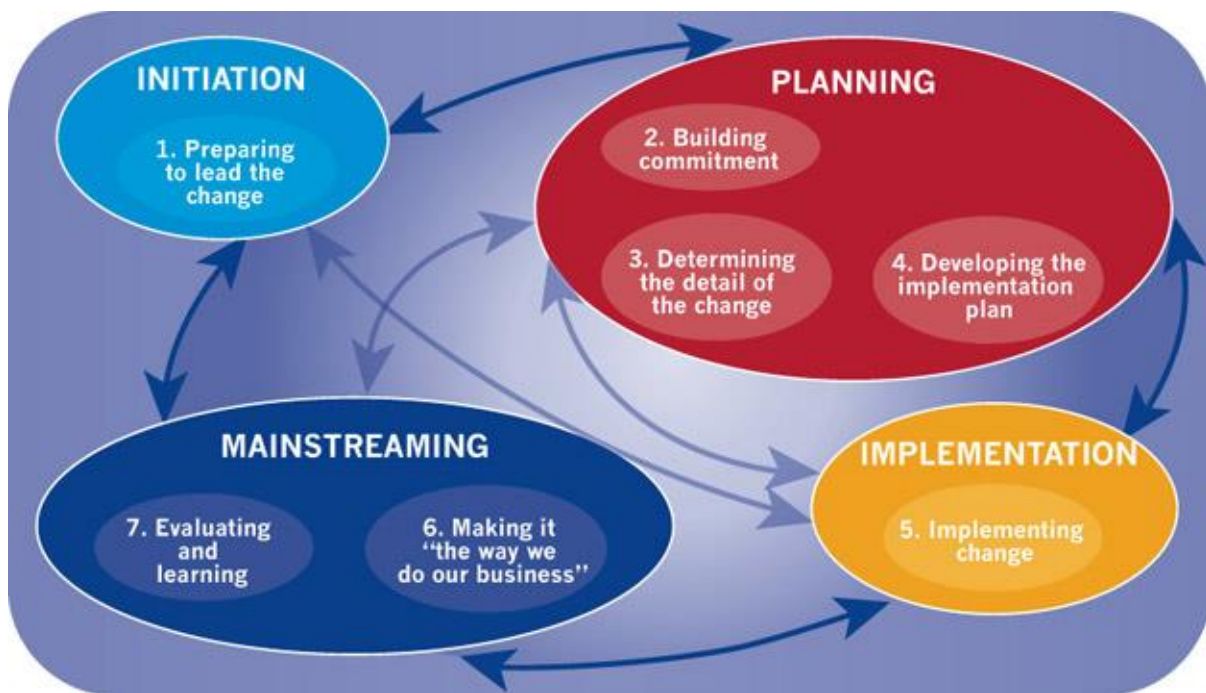
Shanley (2007) describes a top-down approach as leaning heavily on the concept of power, which can be demoralising for employees, whereas a bottom-up approach is heavily dependent on the employee self-efficacy, and tends to be time dependent and often protracted. The social cognitive and behavioural approaches on the other hand provide good insight into employees' perceptions and behavioural beliefs pertaining to change, however have not been widely applied to change within mainstream industry (Southey, 2011).

The Group Dynamics School (Schein, 2004) places emphasis on achieving change through teams rather than individuals, rationalizes that people in organizations work better in teams which would be more applicable to managing change within the Health Service Executive. The Health Service Executive (HSE) change model (2008) developed in Ireland details a step by step approach to planning, managing and implementing change (see figure 1). The HSE model is an organizational development (OD) model which is based on experience of what works in practice and draws heavily from other change models.

### **3.2.1 Why the HSE model?**

The HSE model is process centred and dynamic which suits the writer's project. It places a strong focus on the people involved in the aspects of change. The dynamic nature of the HSE change model provides the opportunity to go back to any stage and re-negotiate. The change model takes cognisance of resistance and so utilises its dynamic ability to recover ground and go back to earlier steps. Unlike the less versatile linear models of change that stands a greater risk of losing momentum if strong resistance arises.

**Figure 1 - The HSE Change Model (2008)**



The writer chose this model as it outlines the key steps involved and offers practical advice and guidance under each phase. The four distinct phases of the change process allow for flexibility and movement between the phases and also recognise the complexity of change. Moreover, this model places strong emphasis on the importance of engaging people in the process of change which Kotter (1996) concurs to be a key to successful change. Sustainability of the change is also a key for this project and the final stage of the HSE model ensures mainstreaming and improved organizational effectiveness.

The model is built on the principles of collaboration and as there are many stakeholders in the health facility, collaboration in change process is vital. The writer will draw from the four phases of the HSE model which include: Initiation, planning, implementation and mainstreaming to discuss this change process. The writer agrees with the fact that managing change is a complex, dynamic and challenging process. It is never a choice between technological or people-oriented solutions but a combination of all (Davis *et al.* 2000).

Coram and Burnes (2001) argued that there is no 'one best way' to manage change in an organization, and that public sector organizations need to introduce an

approach to organization change which matches their requirements and situations. It has to be admitted that change in management will keep happening. Consequently, leaders need to understand the change process and issues that are involved with it in order to have the capability to lead and manage and improve efforts effectively (Davies *et al.* 2000). They must learn to overcome obstacles and cope with the chaos that naturally exists during the complex process of change.

Al-Abri (2007) opine that leaders should help employees and other stakeholders structure and build effective teams by developing new organizational structures and creating a shared vision that focuses on authentic employees output. Such inspired and informed leadership is critical and essential for organizations to be successful. This section has discussed different management change models and theories underpinning them. Also, the reasons for choosing the HSE model as a framework to guide this change project have been highlighted and will be discussed next.

### **3.3 The Change Process**

This project consisted of introducing drug round tabard to reduce non-urgent interruptions during medication, thus reducing medication errors and enhancing patient safety. This section will describe the key actions undertaken using the headings of the HSE change model.

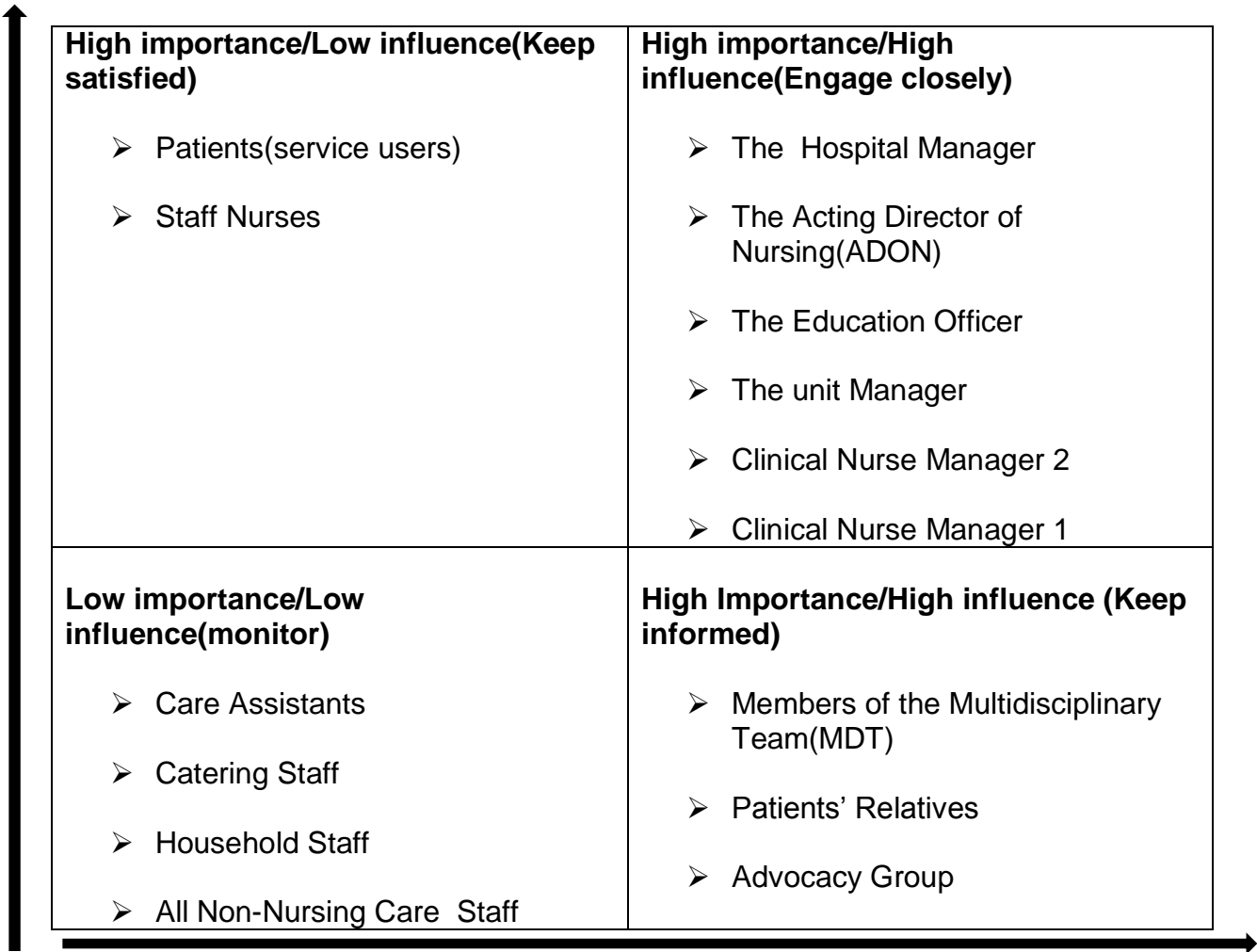
#### **3.3.1 Initiation**

The task of the initiation phase of a change is to lay careful foundations for the change, and spending time developing a sound strategy will help ensure success (HSE, 2008). The first important step in leading the proposed change was to establish key stakeholders who would support the strategy. It is crucial at this stage to identify the drivers and resisters of change (Lewin, 1951) and also to identify the potential impact of the change on key stakeholders through a stakeholder analysis (see table 1).

Reed *et al.* (2009) highlighted the importance of understanding who is affected by the decisions and actions and who has the power to influence the outcome. A stakeholder analysis is a useful tool that enables a change leader to identify the range of stakeholders for a particular project and the degree of their importance and influence over the course of the proposed change. This in turn helps the change

leader to plan actions within the change process in order to ensure a receptive reaction to the change amongst the stakeholders.

**Table 1 - Stakeholder Analysis**



<b>High importance/Low influence(Keep satisfied)</b> <ul style="list-style-type: none"> <li>➤ Patients(service users)</li> <li>➤ Staff Nurses</li> </ul>	<b>High importance/High influence(Engage closely)</b> <ul style="list-style-type: none"> <li>➤ The Hospital Manager</li> <li>➤ The Acting Director of Nursing(ADON)</li> <li>➤ The Education Officer</li> <li>➤ The unit Manager</li> <li>➤ Clinical Nurse Manager 2</li> <li>➤ Clinical Nurse Manager 1</li> </ul>
<b>Low importance/Low influence(monitor)</b> <ul style="list-style-type: none"> <li>➤ Care Assistants</li> <li>➤ Catering Staff</li> <li>➤ Household Staff</li> <li>➤ All Non-Nursing Care Staff</li> </ul>	<b>High Importance/High influence (Keep informed)</b> <ul style="list-style-type: none"> <li>➤ Members of the Multidisciplinary Team(MDT)</li> <li>➤ Patients' Relatives</li> <li>➤ Advocacy Group</li> </ul>

In line with this, an initial meeting was held with the ADON in which the writer outlined the proposed change initiative. The ADON gave approval to proceed and then delegated the Education Officer to act as Sponsor for the change project. Securing mandate gives authenticity and credibility to the process. It ensures alignment and buy-in from key stakeholders in the system, and secures the process of securing resources for the change (HSE, 2008).

The initiative was also introduced to the Line Manager in charge of the unit who also is the chairperson of the Medication Management Committee of the Hospital. The

change project and the rationale were then introduced to the Ward Manager and Staff Nurses of the unit. The writer in association with the nursing staff of the unit brainstormed to identify the strengths and weaknesses, threats and opportunities (SWOT) involved in this project. The SWOT analysis (see appendix 1) is a strategic planning tool used to identify the strengths, weaknesses, threats and opportunities involved in a venture. It consists of a confrontation between external developments and internal capabilities. External developments are identified as either opportunities or threats for the organization, internal capabilities are described as strong or weak points of the organization. Based on the confrontation between the two, options or even a new strategic course can be identified for the organization (Johnson and Scholes, 1993).

In this change project, some of the strengths identified were the timings for medication rounds that did not coincide with visiting times and was always carried out by regular nursing staff of the unit. One significant weakness was staff shortages that affected effective data collection process and also made interruptions unavoidable thereby posing a challenge to the project. Opportunities included effective uptake of educational briefings by staff and team culture of the unit. Resistance and funding constituted threats.

Kotter (2007) advocates that establishing a team with varied skills rich in enterprise, information, titles and reputations is required for successful change to occur. Also, Behfar *et al.* (2008) found that high performing teams explicitly discuss reasons for decisions reached and assigned work to members who have the relevant task expertise rather than using other common means such as volunteering, default or convenience.

Accordingly, the team drew from the result of the SWOT analysis to develop a list of core values, identified and developed goals. Communication was deemed a top priority especially at this initiation phase. Kotter (2007) points out that without credible communication, 'the hearts and minds' of the troops are never captured. Every team member was encouraged to contribute meaningful ideas that will enhance the successful implementation of the project. Heathfield (2006) also stresses the link between communication and response to change adding that people who are offered clarity, honesty, dignity, understanding and compassion have



a greater openness to change and expressing the reasons for honesty and directly will help people to be open to change.

Kanter *et al.* (1992) argued that change is only successful when the entire organisation participates in the effort. As was expected there was a mixed reaction, some staff were open to and welcomed the proposed change while others were reserved and a little hesitant. There was one outright opposition during this initiation phase which was used constructively to build engagement. Kotter and Schlesinger (2008) identified 6 methods of overcoming resistance, so participation and involvement of the individual in some aspect of designing the data collection tool helped to overcome the resistance. The writer listened to concerns highlighted; questions were encouraged and answered fully.

Kotter and Schlesinger (2008) also identified education and communication as key components to overcome resistance. The writer recognised the importance of empowering the staff, therefore at every given opportunity, the writer informed staff on a one-on-one basis as it was not possible to organise training for all staff at the same time. This allowed staff to be fully involved in the change process, and also improve their skills. Therefore, transformational leadership style that empowers participants and transforms their attitudes and beliefs was evident throughout the initiative (Chow, 2012).

Gill (2002) endorses empowerment as part of the change process, whereby knowledge, skills and resources are given to the people involved. The non- nursing staff were not left out, they were also informed of the proposed change project. The rationale and their contribution towards the project were equally outlined. Kotter (1996) assert that in order to achieve success, each change project must have a certain level of buy-in from all those involved i.e. stakeholders and that was evidence at this initiation phase.

### **3.4 Ethical Consideration**

The perception of the study as an audit rather than research meant that ethical approval was not needed. However, to fulfil the requirements from the college, an email was sent to the Research Ethics Committee (REC) of the RCSI to confirm this. The REC believes that since this is part of a general audit to improve quality of care, the staff are aware that it will take place and there is no suggestion that the results

will be published, this project does not need ethical approval. Also, as a group it was felt that the proposed study, satisfied ethical considerations as there was a valid reason for undertaking it, verbal consent will be obtained from staff prior to data collection, it will not have a negative impact upon practice, and would maintain confidentiality throughout the study (Cooper *et al.* 2008).

### **3.5 Planning**

This step involves, building commitment, determining the detail of the change and developing the implementation plan. The purpose of this step is to further increase commitment for the change across the system, build a shared sense of the vision for change and engage in activities that will increase readiness and capacity to enhance the requirements of the new future (HSE, 2008). The key objective of this phase was to gain support and commitment for the introduction of drug round tabard project.

Proctor and Dukakis (2003) pointed out that the key to implementing a change is to get the people involved early, consult with and get them to take ownership of the new idea being introduced. Therefore, it was explained that this is a change project involving audit and the steps involved clearly outlined to all staff involved. Activities involved designing the audit and audit schedule in consultation with team members. This is congruent with the assertion and description of audit by Saunders (2003) as a cyclical process which involves four stages: identifying or setting standards (ideally these should be evidence-based); reviewing current service provision against these standards in order to identify short falls; developing and implementing an action plan to address shortfalls and reviewing the outcome of the action plan.

Consequently, data collection tools to be used pre and post implementation of the change project were developed. These include: (1) The Medication Administration Distraction Observation Sheet (MADOS) (see appendix 2) which was designed following a literature review of the domain content of distractions (Fering, 1987) was adopted to record sources and number of distractions ;(2) A 30- item audit checklist previously used in the writer's organisation was modified to note the nurses' compliance to standard guidelines and policy of medication administration (see appendix 3). (3) Questionnaire was developed for participating staff of the unit to ascertain their satisfaction with the project (see appendix 4). The team members

were briefed on a one – on-one basis on how to use these tools effectively and on the importance of not distracting nurses engaged in medication rounds.

This process is consistent with O’Neal and Manley (2007) who assert that action planning is a key step in achieving change in practice. They added that involving others in the process of action planning enable the intended change to be achieved and sustained.

### **3.6 Implementation**

The implementation stage of the HSE change model emphasises the need for change leaders to remain flexible and responsive to factors within the organizational environment which will inevitably, impact on the change process, attention is paid to sustaining momentum. This section discusses pre-intervention assessment and data collection process, the use of drug round tabard and checklist, and post intervention data collection.

#### **3.6.1 Pre-intervention assessment /data collection**

Data was collected through observation of nurses carrying out medication administration. This is congruent with the assertion made by Barker *et al.* (2002) that observational studies are recommended as the most accurate and efficient data collection method. Nurses to be observed were approached individually and provided with an explanation of the study purpose and protocols. Verbal consent was obtained prior to each observation period. Confidentiality of data was established with code numbers, study materials were kept in a locked cabinet, and participants were assured that they would not be identified in written reports. During observations of the nurses, the observer attempted to remain unobtrusive by standing at least one yard away from the nurse.

Nurse participants were instructed to act as normal as possible while delivering medications, and to tell the observer if a medication was missing or if there was an equipment issue. Medication times during 8am and 4pm were observed, as these are the times when nurses generally have the most medications to deliver, and when nurses typically have the most interruptions and distractions.

For this project, an interruption was defined as an external factor causing the cessation of productive activity before a current task is complete. A distraction was defined as a stimulus from an external source that results in an observable response, but not the cessation of activity (Hickman *et al.* 2003).

A modified version of a validated instrument, MADOS was used to collect a standardised data set that is the number of each 11 sources of interruption experienced during the medication round. The medication round was considered to be the time from which the nurse opened the medication trolley to begin the round until all medications were administered. Slash marks were made under the corresponding cause of the distraction each time a distraction occurred.

The scheduled medication time and total time interval for each observation period were entered on the MADOS form. Also, the medication administration observation audit checklist was used to collect data of compliance to the medication standard and policy. A tick was made under the three columns of 'Yes, No, N/A' across the 30- items on the checklist.

Medication administration errors were also noted on a different sheet of paper. According to Thomas and Peterson (2003) observations of practice are considered to be the most accurate way of measuring the occurrence of medication administration errors. Only the MADOS form was used on night duty rounds and this was filled out by the nurse after the medication rounds. A total of 33 medication rounds were observed and lasted for two weeks.

### **3.6.2 Intervention**

The introduction of drug round tabard was not commenced immediately after pre-intervention data collection as planned due to logistic problems with purchase of the tabards. It does serve to reinforce the point made in the change model that implementation plan will not always go exactly according to plan and that a key task for change leaders is to allow the plan to 'evolve naturally, learning from what occurs and influencing appropriately' (HSE,2008). However, briefing sessions of approximately 7 minutes duration were held with the healthcare professionals on the ward to address issues found during the baseline audit, emphasise on the aims of the programme and to engage the support for it was stressed.

The content of the session relating to behaviour modification altered according to the group being addressed. Paramedical staff were requested not to interrupt nurses administering medication unless it was absolutely essential and to redirect any queries to another nurse not involved in the round. Nursing staff were advised of the following adaptations that aimed to streamline the medication administration process and eliminate unnecessary task interruption (Relihan *et al.* 2010). They include;

- Ensure the trolley is fully stocked with the necessary supplies before beginning.
- Inform your nursing colleagues when commencing the medication round.
- Instruct nursing students to withhold any questions not directly related to the task at hand until the round is concluded.
- Put on the tabard when ready to begin.
- Avoid initiating conversation unrelated to the medication administration process.
- If interrupted unnecessarily, direct queries to another colleague not involved in the round.
- The nursing colleagues of the staff member undertaking the round were instructed to:
  - Not interrupt the nurse administering medications.
  - Divert interruptions and distractions from the nurse undertaking the round- for example by taking telephone messages.
- On night duty, the care assistant takes non-urgent telephone messages until the nurse completes the drug rounds.

This checklist encompassing the practice points detailed above was distributed to staff during the education sessions to reinforce the key messages. In addition, a laminated copy of the checklist was affixed to the inside lid of each of the medication trolleys on the ward. Eventually, on the 13<sup>th</sup> of January 2013, nurses in the unit commenced wearing disposable drug round tabard for medication rounds. The red disposable tabard had black lettering with the words 'Drug round in progress, do not disturb' on the back and front.

The disposable tabard was chosen for a variety of reasons: firstly, it provides an easy means of visual identification and a reminder to avoid interruptions during medication administration through the wordings. Geller (2002) point out that symbols and signage are influential in the society and signs can serve as warnings of impending danger before the fact and can be used as safety reminders to direct behaviour. Signs provide information and can increase awareness of important situations. Secondly, the hospital infection control team envisaged logistical difficulties with ensuring the appropriate decontamination of reusable vests or fabric tabards. Therefore, the disposable tabard was chosen to avoid the need of laundering and thereby eliminate risks from cross-infection. Thirdly, the generous head opening, one size fits all and adjustable side ties can fit all shapes and builds. Lastly, they are appropriate for use in all types of ward.

After three weeks of implementation, nurses were observed for 2 weeks using the same tools as for pre-intervention i.e. the MADOS form, the medication administration observation checklist and paper to record medication administration error. Furthermore, a self-administered questionnaire was distributed to nurses who participated in the project. This was carried out to ascertain the satisfaction of nurses with regard to the efficiency, compliance and safety related to the use of drug round tabard and checklist.

### **3.7 Mainstreaming**

The mainstreaming phase of the change process is where the leader must ensure that the process of embedding the change in the organization is carried through. The phrase for this process in the HSE model is “making it the way we do our business” (p61). To ensure that this embedding happens the mechanisms planned for and established at the initiation phase of the project must be utilised. The second and equally important component of the mainstreaming phase is evaluation and learning.

Evaluation of the project was established through analysis of the data collected pre-implementation and post-implementation. The result will determine whether there has been a reduction in interruptions and distractions during drug rounds, with subsequent reduction in medication administration errors and improvement in compliance to medication administration standards.

Details of the evaluation are discussed in the next chapter. Results of the analysis will be communicated to the hospital medication management committee who will meet and decide to include in the hospital medication policy. The writer will then facilitate briefing sessions in the other units on behavioural medication and the use of drug round tabard to all cadre of staff. The use of the checklist and drug round tabard will become a policy in the hospital and will be regularly audited to promote sustainability. The writer is cognisant that embedding new work practices will not happen overnight (Brzycki & Dudt, 2005) and should be introduced gradually (Penberthy & Millar, 2002).

### **3.8 Conclusion**

The change project involved the introduction of drug round tabard and checklist in the writer's area of practice. Different models of change were critically reviewed and the HSE change model was employed as a frame of reference. The four phases; initiation, planning, implementation and mainstreaming ensured that the writer addressed the central issues related to the change project. At the initiation phase, a stakeholder analysis was conducted to identify the potential impact of the change on key stakeholders. A SWOT analysis was also carried out. The change project was successfully implemented and the next chapter will address the issue of evaluation.

## **4.0 Evaluation**

### **4.1 Introduction**

Evaluation is a way of measuring the extent to which a set of actions achieve its original objectives (Lazenbatt, 2002). According to Ovretveit (2002) there are various types of evaluation in healthcare. These include programme feasibility assessment or option appraisal (carried out to decide if a change project should be implemented or not); process or formative (carried out at the end stage of change initiative), and action evaluation (carried out to seek feedback from stakeholders).

Flippo and Caverly (2000) also identify qualitative and quantitative methods of evaluation and explained that qualitative methods emphasize the perception, feelings and reactions of individuals involved in the project being evaluated. Quantitative method on the other hand emphasizes the numerical expression based on numbers, relationships and experiments.

This chapter will address the evaluation methods used for this organizational development project. The writer will discuss various methods and tools used to collect data on; (a) type and frequency of interruptions and distractions during drug rounds; (b) observed nurses' compliance with the hospital medication administration policy and national standard; (c) types and frequency of medication administration errors and (d) nurses satisfaction with regard to wearing the disposable drug round tabard and use of medication administration checklist. The results of the evaluation will also be presented or analysed.

### **4.2 Methods and Tools used for Data Collection**

Zaccagnini and White (2011) identified various tools for gathering qualitative and quantitative data. Tools for quantitative data include observations, ethnographic interviews, written questions and chart review. Similarly, tools for qualitative data include surveys, health factors and laboratory test results. However, for the purpose of this project, a quantitative approach was employed.

Quantitative data collection method used was observation and chart review. Barker *et al.* (2002) noted that observation studies are recommended in the literature as the most accurate and efficient data collection method. Likewise, Morimoto *et al.* (2004)



argue that chart review can identify both medication errors and adverse drug events. Quantitative survey was also used in form of questionnaire.

### **4.3 Data Collection Method**

#### **4.3.1 Observation**

The Medication Administration Observation Sheet (MADOS) was used to count nurses' distractions during medication administration cycles pre and post interventions. The sources and frequency of interruptions were observed during drug rounds. Potential distraction sources included; Staff nurse, Doctors, Personnel, Visitors, Other Patients, Conversation, Missing Medication, Noise, Telephone, Emergency and Others.

Slash marks were made under the corresponding source of the distraction/ interruption each time a distraction occurred. The scheduled medication time and total time interval for each observation period were also entered on the MADOS form. Comparison of the sources and frequency of interruptions and distractions pre and post intervention was made.

Similarly, a total of 30 documented observations were generated by the observational audit of the medication administration process and identification of nonconformities with existing policies and procedures. These were also compared pre and post implementation. The 30 observation items fell under the categories of; trolley preparation, hand hygiene, checking patient details and instructions, drug preparation, communication with patients and drug documentation. The data were entered using a spread sheet (Microsoft Excel), compliance rates were calculated for each criterion evaluated separately and by category.

#### **4.3.2 Chart Review**

The writer carried out a retrospective chart review of the recording of medication administration for those drug rounds that were included in the observational study. The number and type of errors that were detected by medication chart review were recorded pre and post implementation. In line with this, Montesi and Lechi (2009) opine that chart review is the most precise approach for detecting adverse events,

but is less good for detecting medication errors. They further argue that the results depend on the quality of documentation and reviewers' abilities to capture triggers.

#### **4.3.3 Survey**

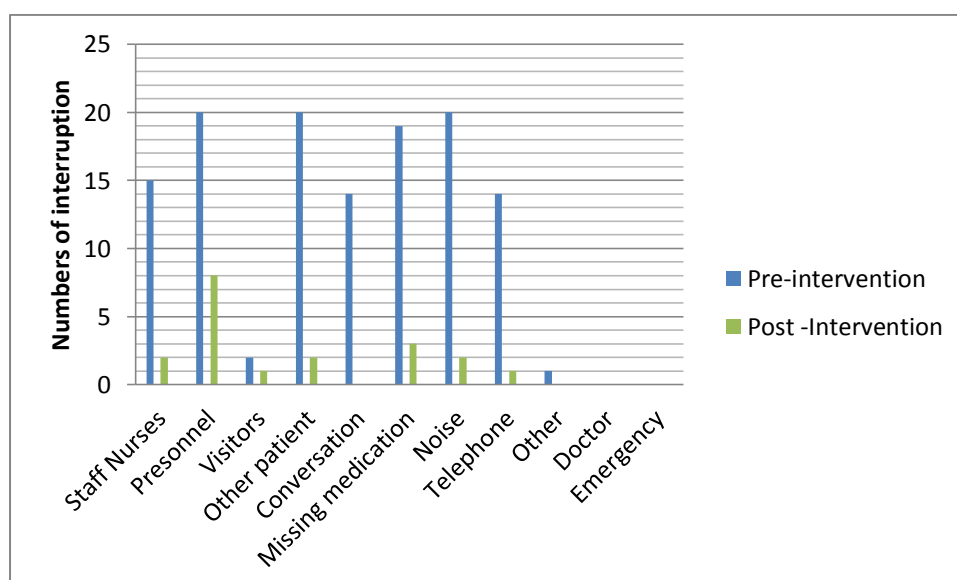
This was carried out to ascertain the satisfaction of nurses with the use of drug round tabard and medication administration checklist with regards to safety, compliance and efficiency. This is consistent with Hurley *et al.* (2007) who observe that if nurses are satisfied with the new medication administration system, they may be more likely to spend their time and energy focusing on the professional aspects of medication administration rather than focussing on the workload or extra time required for the new system. Consequently, the writer designed a paper and pen questionnaire of 8 items and a 5- point Likert rating system anchored with descriptions "Strongly Agree, agree, neutral, disagree and strongly disagree (see appendix 4).

#### **4.4 Evaluation Results**

According to Stufflebeam (2003), evaluation centres on exploring whether what had been planned in a given project has been achieved, how this happened and how it was perceived by those involved. The results of data collected pre and post implementation of change strategies will be analysed and presented in this section.

During the data collection period, 66 Medication administration rounds were observed and 11 sources of interruptions and distractions were documented (see figure 2). Before implementation of the drug round tabard and checklist, a total of 125 occurrences of interruption was counted and 19 times post implementation. Data was analysed using Excel spread sheet. The highest number, 20 was observed from personnel, other patient and noise categories pre- implementation. This was reduced post- implementation as thus; Personnel- 8, other patient- 2 and Noise - 2.

**Figure 2 - Sources and numbers of interruption/distraction**



Missing medication constituted the second highest number of 19 pre implementation but was reduced to 3, post- implementation. Staff Nurses were next high level with 15 counts pre implementation and reduced to 2, post implementation. Telephone and conversation were counted 14 times each pre-implementation with no interruption recorded for conversation post implementation. Telephone interrupted once, post implementation.

In the category of 'other', there was one interruption pre and none post implementation. There were no interruptions and distractions in the categories of Doctors and Emergency. Using simple percentage calculations, Observed distractions and interruptions were decreased by 85% (n= 125).

#### **4.4.1 Compliance with Medication Administration Procedure by Categories**

A total of 44 medication administration rounds were observed, 22 before introduction of drug round tabard and checklist and 22 after implementation (see table 2 ) In the category of trolley preparation, there were 7 non -compliant pre-implementation and complete compliant (n = 44) after intervention.

Most nurses were compliant in the category of checking prescription details and instructions, but there were 11 non-compliant pre-implementation and total compliant after intervention. A large number of nurses were compliant in the category of checking patient details and only 6 non-compliant before and full compliant after intervention.

Compliance to drug preparation category was 16 non-compliance before but full compliance recorded after intervention. Communication with the patient showed the highest number of non-compliance of 28 pre-interventions but there were only 2 non-compliance after intervention.

**Table 2- Nurses compliance with medication policy and guidelines**

COMPLIANCE BY CATEGORIES								
CATEGORY/ITEM			Pre-implementation			Post implementation		
			YES	No	N/A	YES	NO	N/A
<b>TROLLEY PREPARATION</b>								
Prepare trolley			21	1	0	22	0	0
Copy of BNF in trolley			15	6	0	22	0	0
<b>HAND HYGIENE</b>								
Decontaminate hands before medication			14	9	0	22	0	0
Decontaminate hands in between patients			8	15	0	22	0	0
<b>CHECKING PRESCRIPTION DETAILS/INSTRUCTIONS</b>								
Nurse check valid prescription			21	1	0	22	0	0
Nurse knowledge of drug			22	0	0	22	0	0
Nurse check prescribed time			22	0	0	22	0	0
Nurse check time last administered			22	0	0	22	0	0
Drug given close to prescription time			21	1	0	22	0	0
Nurse check prescribed dose			20	2	0	22	0	0
Nurse check prescribed route/form			17	5	0	22	0	0
Nurse check specific instructions			19	3	0	22	0	0
Nurse select appropriate drug			22	0	0	22	0	0
Nurse check expiry date			15	7	0	22	0	0
<b>CHECKING PATIENT DETAILS</b>								
Nurse check personal details			21	1	0	22	0	0
Nurse check for known allergies			17	5	0	22	0	0
Verify patient's identity			22	0	0	22	0	0
<b>DRUG PREPARATION</b>								
Use single medicine pot			22	0	0	22	0	0
Establish sanctioned crush medicines			19	3	0	22	0	0
Use single pill crusher			10	11	0	22	0	0
Double check drug with prescription			20	2	0	22	0	0
<b>COMMUNICATION WITH PATIENT</b>								
Communicate information sensitively with patient			9	13	0	20	2	0
Administer medicine personally			15	7	0	22	0	0
Nurse stay with patient until swallow			15	7	0	22	0	0
Remove medicine if not taken			8	4	10	9	0	13
<b>DRUG DOCUMENTATION</b>								
Document drug not given			6	4	12	5	0	17
Document omission in the narrative note			1	5	16	2	1	19
Nurse initial mistake			7	5	10	0	0	22
Nurse left trolley unlocked or unattended			8	14	0	0	0	22

The second highest non-compliance was in the category of drug documentation. There were 16 non-compliance pre-intervention and after intervention, there was 1 non-compliance.

A single item had a reverse question, 'did the nurse leave the medicine trolley unattended during the course of the medicine round or when unlocked?' in this, there were 8 non-compliance before and after implementation, there was full compliance.

Overall non-compliance was reduced with the use of drug round tabard and checklist, which indicates improvement.

#### **4.4.2 Medication Administration Error Results**

This section discusses the result of medication administration errors captured during the period of the studies. The errors include; omission, wrong dose, wrong form, wrong route, wrong time (see appendix 5 for definitions) and comparison made between pre and post intervention data collected.

#### **4.4.3 Pre-Implementation Results**

The evaluation was carried out 6 weeks prior to the implementation of this change project and the following types of error were detected (see table 3). During the Study period, 22 drug rounds were observed, there were 5 omission errors, 2 wrong dose errors, 5 wrong route errors and 7 wrong form captured by observation.

The writer reviewed 17 medication charts and detected 17 omission and 10 wrong time errors. There was no wrong resident error and none recorded on the medication incident form for the period of review. A total of 46 errors were detected, chart review detected 27- (59%) and observation detected 19 (41%).

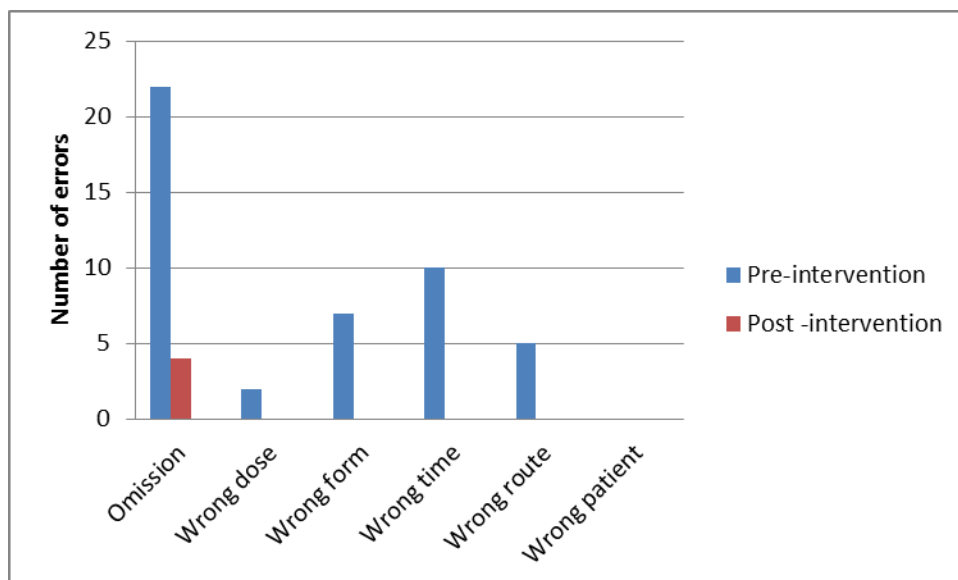
**Table 3- Type and Frequency of Medication Administration Errors pre- and post-implementation**

Types of Error	Chart Review		Observation		Medication Incident reporting Form	
	Pre	Post	Pre	Post	Pre	Post
Omission	17	3	5	1	-	-
Wrong Dose	-	-	2	-	-	-
Wrong Form	-	-	7	-	-	-
Wrong Resident	-	-	-	-	-	-
Wrong Route	-	-	5	-	-	-
Wrong Time	10	-	-	-	-	-
Total	27	3	19	1	-	-

#### **4.5 Comparison of Pre and Post Implementation Medication Administration Errors**

The use of drug round tabard and checklist was evaluated 3 weeks post implementation. Type and frequency of medication errors detected were as follows (see table3). Chart Review- Omission (3) and Observation (1). There were no other errors detected (see figure 3). A total of 4 errors were detected post implementation. In comparison with errors detected pre-implementation, chart review detected 6.5%, Observation 2.2% and still none from medication incident report form-0%.

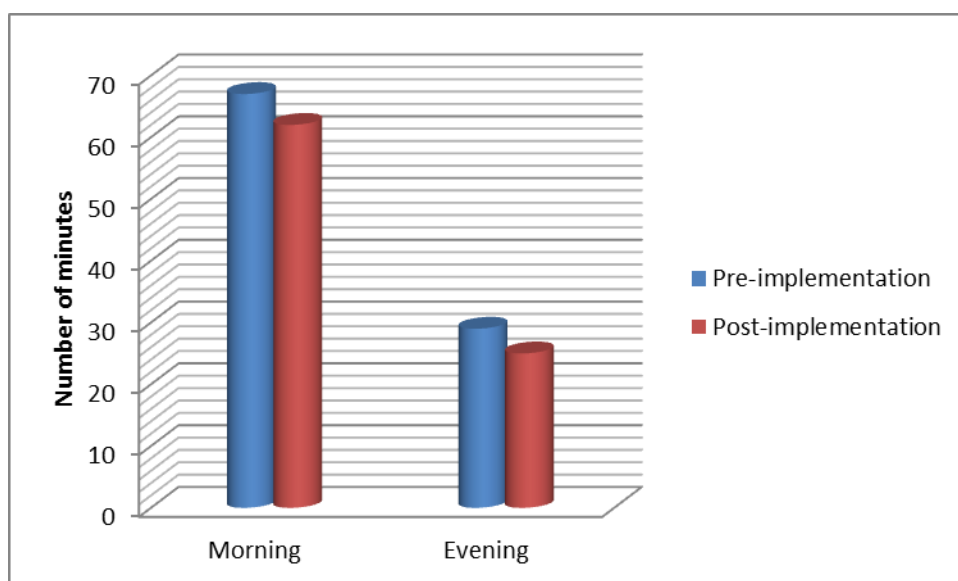
**Figure 3 - Medication administration errors**



#### 4.6 Time

Pre- intervention, it took an average of 67mins to administer drugs to 17 patients in the morning, and 62mins post intervention, 29mins in the evening pre-intervention and 25mins post-intervention with a total of 9minutes saved. Fewer interruptions also mean nurses are able to make better use of their time.

**Figure 4- Average medication time**



## 4.7 Cost

The financial cost of the drug round tabard is minimal: A box of 250 tabards is 57.43 Euro which cannot be compared to the cost of adverse events. The UK Audit Commission estimate that the adverse events associated with the use of medicines in the NHS cost £820 million per year and that this cost trend is upwards (DH, 2004). This does not include the cost of litigation or of human suffering associated with these events. If these estimates are extrapolated to the Irish population it will amount to a potential cost of €54.6 million for extra bed occupancy alone. To place €54.6 million in context this is almost half of the total amount of money spent by Irish hospitals on drugs each year and it is more than double the amount spent on staffing the pharmaceutical services in the hospitals (HSE, 2005).

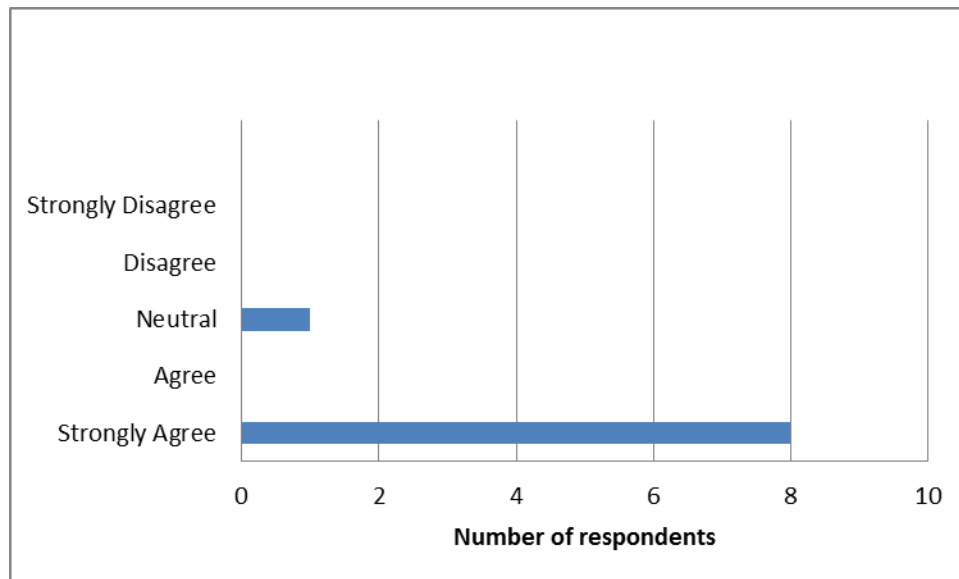
A more significant cost of adverse events is the human one: the personal costs of medication errors for patients may include suffering, the need for additional treatment, loss of income, and death. Family members also experience emotional trauma as a result of seeing a loved one suffer. Therefore the benefits of drug round tabard outweigh the financial cost.

Survey of the nurses' satisfaction with the use of drug round tabard and checklist was carried out. The 8 item questionnaire attempted to measure with regards to safety, compliance and efficiency (see appendix 4). Nine nurses who participated in the project completed the questionnaire. 8 nurses strongly agreed that the use of drug round tabard is effective in reducing interruptions thereby preventing medication administration error, one nurse remained neutral (see figure 5).

8 nurses also strongly agreed that the use of drug round tabard helps to be focussed and concentrate on medication administration while 1 nurse agreed. On compliance with Hospital's medication administration policy, 5 nurses strongly agreed while 4 nurses agreed.



**Figure 5- The use of drug round tabard is effective in reducing interruptions thereby preventing medication administration error.**



On timely completion of drug rounds, 3 nurses strongly agreed while 6 just agreed. On the items of efficiency and support by other members of staff, 5 nurses strongly agreed and 4 agreed. On items of preparation and documentation, 6 nurses strongly agreed and 3 agreed.

The writer has recognised the limited number of respondents in this questionnaire. A focus group was planned to boost the data quality, but due to time constraints and other reasons beyond the writer's control a formal focus group could not be conducted. However, individual verbal feedback on overall experience of staff using the drug round tabard and checklist was sort. 5 out of 9 nurses that participated in the project were very positive and appreciated the protected time to undertake this vital nursing role.

They also stressed that the project made them more focused during drug rounds which reduced the number of medication incidents. On the other hand, they expressed their frustration when there was staff shortage and they had to be unavoidably interrupted thereby violating the rules of the project.

## **4.8 Conclusion**

In this chapter, the writer has discussed the methods and tools used to evaluate the use of disposable drug round tabard and checklist. The results of the data collected have also been presented using quantitative data collection method, it is obvious that the change had led to an improvement, implying that the objectives of the change project were achieved.

## **5.0 Discussion and Conclusion**

### **5.1 Introduction**

Having no distractions and interruptions would be ideal but not always possible in health care. The intervention in this change project suggests that improvements in the system can and do work. In this chapter the writer will discuss impacts of the drug round tabard and checklist on reducing distractions/interruptions thereby reducing medication administration errors and improving compliance to policy.

Also, the strengths and limitation of the change will be outlined, the implications for management and recommendations for future improvements will be provided. The chapter ends with a conclusion, bringing together the key points raised in the discussions.

### **5.2 Impacts of the Drug Round Tabard and Checklist on Reducing Distractions and Interruptions**

In line with other published research assessing disruption to medication rounds (Palese, *et al.* 2009, Kreckler *et al.* 2008, Pape, 2003 & Pape *et al.* 2005), it is found that nurses administering medications experience high volumes of distractions and interruptions from a variety of sources. In this study, the number of interruptions and distractions were counted from different sources; although a variety of alternative measurements have been used in other studies of interruptions on medication rounds (Relihan *et al.* 2010; Pape *et al.* 2005). The disposable drug round tabard was important as a visible symbol for the nurse to indicate to others not to interrupt her when administering medication.

The nurse also followed an established checklist as a reminder for the correct steps to follow during drug rounds. Staff members provided additional support for the nurse wearing the tabard. The overall result demonstrated a decrease from 125 to 19, the number of distractions and interruptions that nurses experienced during the intervention compared to pre-intervention.

It was discovered that the greatest sources of interruption of medication rounds were from the categories of personnel, other patient and noise. Distractions from the category of personnel were mainly to obtain information regarding patients care, seeking assistance and initiating personal conversations.

This could be attributed to the fact that coordination of care is the second main task carried out by nurses when interrupted while administering medications. However, there was a significant reduction from 20 to 8 with repeated briefing sessions and the use of the tabard by nurses.

Behaviour changes were evident, as personnel were observed approaching the medication trolley, but once alerted by the red tabard, their queries were diverted elsewhere. Although, sometimes interruption was inevitable when there was shortage of staff and only the nurses administering medication was available to coordinate duties for regular and agency staff.

The intervention programme demonstrated its effectiveness in the category of 'other patient' source of interruption. This could be attributed to the fact that only few patients in the unit have the capacity to interrupt. Some of the patients have health conditions ranging from mild cognitive impairment to severe dementia.

As a strategy to minimise the impact of missing medications, the nurse undertaking the drug round was required to replace empty containers of medicines from ward stock to the medicine trolley in preparation for the next round. Also, the night staff was required to check medication trolleys and replace missing items as necessary. Subsequently, reduced travel by the nurse administering medications resulted in fewer interruptions opportunities for visitors or staff in the corridor.

The drug round checklist contributed to the positive effects of reducing interruption, it was a reminder for nurses to check that the trolleys are filled with the necessary requirements before starting the rounds. Consequently, in this category of missing medication, interruption was reduced from 19 to 3 after intervention.

This study found that one of the greatest sources of disruption of medication rounds was nurses themselves, a finding which has been replicated in previous studies (Kreckler, *et al.* 2008, Pape 2003, Relihan *et al.* 2010). Interruptions were self-induced when the nurse administering medications initiated conversation, went to deliver nursing care, and went looking for equipment or when other nursing colleagues needed their attention. The use of drug round tabard and checklist prompted nurses to be more focused during drug rounds. Also, the aspect of initiating social conversation was remarkably reduced post-intervention and this had

the additional effect of reducing noise levels which in turn resulted in fewer distractions and interruptions during medication administration.

Telephone calls were one of the most disruptive types of interruptions, requiring the nurse to physically and mentally disengage from the task at hand for possibly several minutes. Some nurses had the habit of keeping the ward mobile phone in their pockets during drug rounds if they are in charge for the day. The intervention proved very effective in this category, the ward mobile phone was given to the nurse not involved in drug round. Phone calls were the easiest for staff to divert from the nurse undertaking the medication round in that an advance warning of an interruption was issued in the form of the phone ringing. It was also mentioned on the checklist that even on night duty when there is only one nurse on duty, a nursing care assistant was required to answer phone calls and take non-urgent messages until drug round is completed. This resulted in a reduction of interruption in this category from 14 to 1.

The 'Other' source of interruption was negligible with 1 pre and non-post intervention. There was no interruption in the categories of 'doctors' and 'emergency' pre and post intervention whereas some authors have found that doctors contribute substantially to overall number of interruptions and distractions (Kreckler *et al.* 2008 & Pape *et al.* 2005). Others have found doctors to be a minor source of disruption to the medication round (Elganzouri *et al.* 2009).

There was 1 interruption pre-intervention in the category of visitors and non-post intervention. Similarly, some studies also found a decrease in the number of distraction from visitors following intervention (Freeman *et al.* 2013, Relihan *et al.* 2010).

These results provide evidence that distractions during medication administration can be significantly reduced by educating staff members to the importance of not distracting nurses during medication administration. Interruptions could also be reduced by delegating to other staff members those activities not strictly linked with medication management, an attitude developed by nurses after the introduction of drug round tabard and checklist. Staff members applied the team work approach well during the study intervention period and their efforts to prevent distractions supported the nurses' ability to focus during medication administration.

The argument that interruptions lead to errors is persuasive and controlled laboratory studies of task interruptions have clearly demonstrated their contributions to task inefficiency and errors (Westbrook *et al.* 2010). Experimental studies suggest that interruptions produce negative impacts on memory by requiring individuals to switch attention from one task to another. Returning to disrupted tasks require completion of the interrupted task and then regaining the context of the original task (Altmann & Trafton 2005).

In surveys and retrospective accounts of adverse events, interruptions have been implicated yet real world evidence of the relationship between interruptions and clinical errors is scarce (Grundgeiger & Sanderson, 2007). Interruptions, as also in this study have been suspected to be a potentially important contributor to hospital medication errors based largely on self-reports surveys and retrospective analyses of voluntary reports.

Reality is complex; interruptions do not take place in a vacuum, but are situated in a context (Brixey *et al.* 2007). Interruptions are one of the potential contributions to medication administration errors. Safety culture (Aspden, 2000), nursing leadership (Wong & Cummings, 2007). The number of hours worked by nurses (Rogers *et al.* 2004) their work load (Tissot *et al.* 2003), and medication complexity (Scott-Cawiezell *et al.* 2007) have also been identified as potential contributory factors.

The inclusion of these emerging contributing factors in future studies would enable an estimate of the relative contribution on interruptions compared to other contributors through multivariate statistical analysis. This will facilitate the prioritization of efforts towards reducing the number of medication administration errors by prioritizing the greatest contributors. Furthermore, the inclusion of other potential contributors will offer evidence on the contextual factors under which interruptions are most detrimental.

### **5.3 Impacts of the drug round tabard and checklist on reducing medication administration errors**

Medication administration errors were captured through chart review and observation but most errors were not serious and no patient suffered observable harm as a result of errors. The commonest types of errors were omission, wrong time, wrong route and wrong dose will be discussed.

### **5.3.1 Omission Errors**

The chart review detected more omission errors than observation. The highest number noted pre-intervention were basically omission of a medication without a valid clinical reason and failing to sign the medication chart after a medication had been administered. Cohen (1999) also reported that documentation of drug administration is one of the contributory factors to administration errors in the ward which was also observed in this study. Right documentation is one of the nine rights of medication administration identified by Elliot and Liu (2010). They opine that, once a nurse administers a medication, it must be signed or recorded immediately otherwise, it may be forgotten and the patient may be given another dose.

Similarly, recording the administration of drugs before it is given may run the risk of a dose omission if the staff is called off to attend to other duties before the dose is delivered or the patient may refuse their medication or in some cases forget to take them. They added that when administering medications 'as needed' (PRN), the nurse should make a note of it in the patient's medical record as well as signing the chart. Nurses should always be aware that accuracy of documentation is an important legal responsibility (Woodrow, 2007).

In this study, it was observed that most of the prescriptions for topical preparations, and regular laxatives were not being administered. Likewise, omission errors have also been reported as the commonest type of administration error in observational studies conducted in hospitals (Baker *et al.* 2002).

### **5.3.2 Implications of wrong time**

Incorrect time error were the second most common type of error in this study but many of these errors were not likely to cause patient harm. These were identified on night shift, where the medicine was given over one hour earlier or later than prescribed. Although this was not a problem for some patients, but night sedatives given too early made the patients to wake up too early.

Moreover, it can be a significant problem for those patients who require their medicines at specific times, for example those on anti-Parkinson's drugs. As observed in one study, administration at the incorrect time accounted for 31 % of all medication errors (Dean, 2005). A study of medication errors in 36 healthcare

facilities in North America found that nearly half (43%) of the errors involved medications being administered at the wrong time (Barker *et al.* 2002). The guiding principle is that medications should be administered as closely to the prescribed time as possible. Bullock *et al.* (2007) further emphasis that if a medication is ordered to be given at particular time intervals, the nurse should never deviate from this time for more than half an hour. If administration occurs outside this thirty minute window period, bioavailability of the medication may be affected.

If system factors, such as workload, resulted in a medication being administered before or after the prescribed time Elliot and Liu (2010) suggest a medication error or incident form, may need to be completed. This will allow the contributing factors to be investigated and hopefully eliminated in the future.

Administering medication at the right time also involves preparing the medication at the appropriate time. Medication should not be prepared many hours (or even one hour) before they are administered, unless the manufacturer recommends this. The right time of administration also involves administering the medication at the right rate. A recent study found that medications being administered too quickly or too slowly accounted for 75% of all errors (Dean, 2005). In this study, after intervention wrong time error was no more noted.

### **5.3.3 Implications of wrong form**

Another type of error captured through observation was wrong form error. Tablet crushing and capsule opening were mainly observed. In this study, crushing was done for two main reasons; for patients with swallowing difficulties and for uncooperative patients, but there were also instances of tablets being crushed for no obvious reason. Survey of nursing and care staff has also reported that tablet crushing is common in residential and nursing homes (Wright, 2002).

As is the practice of concealing drugs in food and beverage (Kirkvold & Engedal, 2005) crushing tablets alters the bioavailability of some drugs and may have serious consequences for the patient. It may be appropriate but should be authorised by the prescriber although textbooks traditionally state that some medications should never be crushed. Enteric- coated tablets are designed to dissolve in the alkaline environment of the small intestine, and some drugs are enteric- coated because the



active ingredient will irritate the stomach mucosa if they dissolve there (Adams and Koch, 2010).

However, if the medication only comes in tablet form, and it is essential that it be administered, the nurse may have little choice if faced with this problem, the nurse should discuss the medication with the prescriber (or a pharmacist), as there may be other drugs in an alternate form. Nurses should not simply choose to not administer a drug or crush it regardless of the consequences. In this study, after briefing sessions with nurses, there was no instance of wrong form error after intervention.

#### **5.3.4 Implications of wrong route**

There were five observed instances of wrong route errors pre-implementation and none post-intervention. These involved giving medicines orally to a patient in which it was prescribed to give through percutaneous endoscopic gastrostomy (PEG) tube. The reasons being that the patient can tolerate oral intake and it's quicker to give through oral route. The literature makes it clear that nurses are only allowed to administer medications by the route prescribed, though sometimes the prescriber may give a choice (e.g. PO /PR). The nurse must understand the differences between these routes such as the rate of absorption or onset of action.

Numerous errors have been reported involving the correct medication being administered to the correct patient but by the incorrect route. Cases involving vincristine vinca alkaloid; (antineoplastic) being administered intravenously instead of intrathecally (and vice versa) have resulted in patients deaths (ACSQHC, 2005). Of the few patients who survive this type of error, devastating neurological consequences, such as quadriplegia, are experienced. Unfortunately, this specific error involving vincristine has been occurring for many decades (Donaldson, 2008).

Tissot *et al.* (2003) observed that the labelling of medications may also be to blame for such medication errors. Nevertheless, nurses need to be far more knowledgeable than in the past as each of these routes has associated technology or equipment that must be understood. The increases in medication complexity and technological advancement increases the risks associated with medication administration (Tang *et al.* 2007; Keohane *et al.* 2008).

### **5.3.5 Implications of wrong dose**

In this study, 2 wrong dose errors were observed at baseline but none post implementation. These concerned giving under dose of liquid laxative and giving one sachet as opposed to two sachets prescribed. These particular instances may be minor but wrong dose error have been known to be an important cause of morbidity and mortality in general hospitals, and in one large USA study, they were the second most common cause of fatal medication errors. (Philips *et al.* 2001). In clinical practice, nurses are enjoined to only administer the dose prescribed by the medical officer and must also be cautious when reading the patients medication chart.

### **5.3.6 Lack of reporting**

Throughout the period of this study, no type of error was reported on the medication incident reporting form even when the hospital policy demands that all forms of error including near misses should be reported for investigations. This is probably because these errors were not likely to cause patients harm but may be an indicator of a system failure. Therefore, it has been recommended that all errors should be reported (Chua *et al.* 2009).

## **5.4 The impacts of intervention Strategies on Compliance to Medication Administration Standard and Policy**

In this study, one of the objectives was to compare nurses' compliance to the national and the hospital's medication administration standard and policy after the implementation of preventive and corrective measures aimed at improving the medication process. Compliance assessment was carried out through observation of nurses during drug rounds. An initial assessment was made and the results made it possible to define a set of priority criteria that needed to be improved. The impact of the corrective measures put in place after this assessment was evaluated using the same observational methodology.

Medication process non-compliance is closely tied to medication errors and thus to patient safety. The 30- item checklist was categorised for the purpose of analysis (refer to table 2). Categories that had low rates of adherence included hand hygiene, communication with patients and drug documentation. In the observation criteria of

'decontaminate hands before, and in between patients', most nurses washed their hands before commencing drug rounds but failed to decontaminate hands in between patients.

This suggests that nurses believe they do not need to decontaminate hands in between patients for oral drug administration. Many nurses argue that because external and oral medications tend to be individually wrapped, there is less risk of direct infection. In the unit, oral medications are given using single medicine pot and disposable spoon so there is no direct contact with the patient, and less risk of direct infection. Researchers have not established a relationship between hand washing, oral medication and hospital infection. However, hand hygiene including washing and alcohol rub in the health care setting has been promoted for generations and is recognised as the single most important procedure for preventing cross infection.

In the category of communication, some nurses did not bother to communicate information sensitively with patients. This may be related to the fact that most of the patients suffer from age related dementia and cognitive impairment. During the study, some nurses had the habit of leaving medicines prepared by them for other nurses and healthcare assistants to give. This issue was addressed after baseline observations and not observed post intervention.

There was a low rate of compliance in the category of drug documentation, drugs omitted or refused by patients were not documented in the narrative note .These issues were addressed and corrective measures applied. All the intervention measures applied were effective as evidenced by increased compliance rates for the respective category after implementation.

Although it is not yet scientifically proven, there seems to be a strong relationship between interruption, compliance rate and medication errors. As noted in this study, a reduction in interruption subsequently reduced medication administration errors and increased the rate of compliance to medication administration policy.

## **5.5 Impact of the Change on the Organisation**

Rules, procedures and guidelines are insufficient for limiting medication administration errors, rather, the ward climate needs to change, to become mindful

and alert to any deviation from best practices and behaviours (Drach-Zahvy and Pud, 2010).

The impact of the change project was felt in the unit after only a short time and this is important for continued success and for use in other units. All the staff in the unit became aware of their respective roles regarding the protected time for medication. As shown in the result, interruptions and distractions were greatly reduced, compliance to medication administration policy improved and medication administration error minimised.

Some units in the hospital have indicated interest to adopt the strategies while some units have already adopted aspects of the change initiative. For example, nurses in other units have stopped taking phone calls while on drug rounds which indicates openness and readiness to change. During a recent unannounced HIQA visit to the unit, the project received a high recommendation which has made a positive impact on the entire organisation.

Furthermore, feedback from the participants about the project indicates that the introduction of drug round tabard and checklist initiative was a success. They expressed positive outcomes and the desire to have these strategies incorporated in the hospital policy.

## **5.6 Strengths and Limitations**

### **5.6.1 Strengths**

The obligation and accountability of patient safety bestowed on healthcare workers has made nurses to hold the issue of medication administration errors with a great substance. The strength of this project could be attributed to the leadership commitment, readiness for change and support of all the stakeholders involved in the project.

A particular strength of the project lay with the participative and team approach of nurses and other staff engaged with the project. Discussions during Action Learning Set meetings (ALS) provided support to develop action plans, to change and make changes, and improvements towards the project. Also, adopting the HSE change model facilitated a step by step approach to initiation, planning, managing and implementing change.

### **5.6.2 Limitations**

This was a project carried out in one unit of the hospital which provides long term care for the older persons and therefore the findings may not be generalizable to other units or general medical-surgical units.

A limitation of the data collected is that they provide only a small sample and it would be useful to undertake further studies within different wards in the hospital and beyond. This would help to establish the frequency and distribution of interruptions and distractions thus enabling to make the link with genuine patient safety issues which this problem may cause.

Observation bias cannot be dismissed. During the observation, in accordance with the Hawthorne effect (Polit & Beck, 2008) a form of reactivity whereby subjects improve or modify an aspect of their behaviour being experimentally observed simply in response to the fact that they are being studied, some changes in the interruption behaviour might also occur. In fact, the evaluation of the nurses' work was not carried out without their knowledge, as they were aware of the evaluator, the nurses behaviour could have been modified in order to become more compliant to medication administration policy. Another bias was underlined by the observers themselves. Some nurses were not very serious with observations. Also, staff shortages limited staff nurses from carrying out effective observations of drug rounds for data collection.

Furthermore, a delay in the purchase of drug round tabards due to logistics problems affected the prompt take off of intervention as earlier planned. The questionnaires completed by nurses to assess their satisfaction with the project were not validated; therefore findings may not be generalized within the hospital.

### **5.7 Recommendations**

The study findings support the necessity of using distraction reducing techniques to improve medication safety. Hence, recommendations for organisations and department, nurses and general will be discussed.

### **5.7.1 Organisation and Departmental recommendations**

Changes in working relationships must be addressed immediately to increase nurses' focus during critical tasks such as medication administration.

Improving teamwork should be considered as an effective distraction- decreasing technique.

Leaders must demonstrate support for safety and expect employees to model an attitude of safety in work relations.

To improve concentration, protocols used should be specific to the most frequently occurring sources of nurses' distractions.

Environmental factors such as high noise levels and conversation should be decreased as much as possible.

A rule should be implemented that nurses should be left alone when they stand at the medication trolley.

A visible symbol in form of drug round tabard is needed that identifies nurses, indicates to others that nurses are administering medications, and signifies that distractions are unwanted.

Standard protocols for medication administration should be established based on evidence-based guidelines.

Medication administration methods should be modified to include standard protocol checklists as safety reminders. Experiences from aviation industry have demonstrated the effects of making systems error proof.

Hospital wards should consider conducting regular education sessions for staff, covering medications frequently prescribed in that clinical area, as well as topics like indications, dose range, drug forms and routes of administration.

Education and training with regards to effective communication and psychosocial supports for all staff caring for patients with dementia should also be provide as recommended for National Dementia strategy, 2014 (*Cahill et al.*2012).

Regular auditing and evaluation of all elements that contribute to the medication management process will enable system re-engineering initiatives such as simplification, standardization and checks and balances that may be employed to minimize risk of error.

Organisational policies and procedures should be established to prevent medication errors and should involve multiple departments, including pharmacy, medicine, nursing, risk management, legal counsel and organizational administration.

Sufficient personnel must be available to perform tasks adequately. Policies and procedures should ensure that reasonable workload levels and working hours are established and rarely exceeded.

There should be an on-going systematic programme of quality improvement and peer review with respect to the safe use of medications.

Management should adopt anonymous incident reporting scheme. The value and advantages of anonymous incident reporting have recently been recognized in reports from the UK's National Health Service (NHS, 2007, DOH, 2000, and the USA's Institute of Medicine (Kohn *et al.* 1999). Anonymity encourages good rates of reporting and avoids the situation of individuals who report often, being singled out by those who still believe that incidents equate to incompetence.

As near misses are typically more common than accidents, systems based incident reporting that includes near misses and system problems, has the potential to identify and correct problems before an accident occurs- but only if reporting levels are high. Honest and full incident reporting in a non-punitive ward environment goes a long way towards implementing a systems approach to drug error reduction.

### **5.7.2 Recommendations for nurses**

Nurses should follow recommended guidelines of medication administration (even if they have no history of error), like 'triple checking' the medication during preparation, immediately before administration and afterwards (Xingming & Guinei, 2003). At an individual level, it is the responsibility of each nurse to take appropriate steps to develop and maintain competence in relation to all aspects of medication management and to ensure that their knowledge skills and clinical practices are up to date (UKCC, 2000 & An Bord Altranais, 2007).

### **5.7.3 General recommendations**

Further research is needed to better document the contribution of work interruptions to medication administration errors, considering the limited evidence found. Full consideration should be given to how work interruptions are embedded in a cluster of factors that best predict medication administration errors.

Future research should demonstrate improved methodological vigour that includes a precise definition of the concept of work interruptions, which translates into a clear operationalization of what is to be reliably measured.

Concurrently, descriptive studies are also needed to better understand work interruptions characteristics such as their sources, interrupted primary task, secondary task, and duration and work interruption strategies employed by nurses.

A better understanding of work interruption characteristics will inform frontline nurses and administrators to develop effective interventions to reduce the number of work interruptions experienced by nurses.

### **5.8 Conclusion**

The interruption of drug rounds has considerable implications for patients' safety. Evidence so far shows that nurses' work environment is characterized by frequent work interruptions that are initiated mostly by members of the nursing team, that consist mainly of face-to-face interactions that are mainly for patient management purposes and that are of short duration. Limited evidence exists on whether these work interruptions actually contribute to medication administration errors. This observation calls for further studies that will require a comprehensive approach through the inclusion of other emerging, key contributing factors to medication administration errors. Such evidence is urgently needed to develop effective prevention strategies.

Meanwhile, all healthcare professionals have a responsibility in identifying contributing factors to medication errors and to use that information to further reduce their occurrence. This change project involved the introduction of disposable drug round tabard and checklist to reduce interruption, reduce medication errors and enhance patient safety.



The HSE change model was chosen to facilitate the project as it is considered a bottom- up approach and places strong emphasis on the importance of engaging people in the process of change. The project was evaluated using quantitative data collection method. The feedback from participants and survey respondents is that introduction of drug round tabard and check list is a welcome initiative as it has improved staff efficiency and enhanced patient safety

Although this was in one unit of the hospital, the writer will continue to work with the medication management committee and the organization to ensure that this project is rolled out to other units of the hospital.

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## 7.0 Appendix

### Appendix 1- SWOT ANALYSIS

STRENGTHS	<ul style="list-style-type: none"><li>➤ Conducive medication administration times (08.00hr, 16.00hr &amp; 22.00hr).</li><li>➤ Regular nursing staff from unit giving medicines.</li><li>➤ Few mobile patients in the unit.</li><li>➤ Physical layout of the unit.</li><li>➤ Team work.</li><li>➤ Contributions from Action Learning Set meetings.</li></ul>
WEAKNESSES	<ul style="list-style-type: none"><li>➤ Medication missing from the trolley.</li><li>➤ Staff shortages.</li><li>➤ Agency staff replacing regular staff.</li><li>➤ Staff, patient and visitor interrupting during drug rounds.</li><li>➤ Initiating non-medication related conversation by nurse carrying out drug rounds.</li></ul>
OPPORTUNITIES	<ul style="list-style-type: none"><li>➤ Protected drug rounds.</li><li>➤ Training of nurses on safe medication rounds.</li><li>➤ Non-medication staff to handle phone calls, interruptions or queries.</li><li>➤ Educating staff, patients and visitors that nurses administering drugs are not to be disturbed.</li><li>➤ Use of identifiable clothing (red tabard) by the nurse doing medication.</li><li>➤ Use of drug round check list.</li><li>➤ Nurses to take responsibility of replacing medicines when finished from packet or bottle.</li><li>➤ Night staff to check drug trolleys to ensure they are fully stocked for the day.</li></ul>
THREATS	<ul style="list-style-type: none"><li>➤ Non-compliance or resisting attitude of staff.</li><li>➤ Staff shortages.</li><li>➤ Funding.</li></ul>

**Appendix 2 Medication Administration Observation Sheet (MADOS) with Definitions of Distraction categories while Administering medications**

(Adapted from Pape, T. (2003) Applying airline safety practices to medication administration.)

Pre ---- Post ----- Department ----- Date of Observation -----								
<b>Prescribed Medication Time</b> ----- <b>Start Time</b> ----- <b>Stop Time</b> ----- <b>Duration</b>	<b>Number of Distractions</b>							
	<b>STAFF NURSES</b>	<b>DOCTORS</b>	<b>PERSONNEL</b>	<b>VISITORS</b>	<b>OTHER PATIENT</b>	<b>CONVERSATION</b>	<b>MISSING MEDICATION</b>	<b>NOISE</b>

**NOTE: Place a slash on the column above at each interruption/ distraction.**

A distractor includes any action that draws away, diverts, or disturbs the mind or attention from achieving the medication administration goal. Categories are further defined below.

**Staff Nurses** Interruption and distractions caused by staff nurses not involved in administering medication.

**Doctors** Interruption and distractions resulting from doctors on the ward

**Personnel** Interruption and distractions caused by hospital staff, other than nurses and doctors e.g. health care assistants, catering staff etc.

**Visitors** Interruption and distractions arising from members of the public visiting patients on the ward

**Other patient** Interruption and distractions of the nurse by a patient other than the one to whom the nurse is administering the medications.

**Conversation** Initiation of conversation unrelated to the task of administering medications by the nurse undertaking the rounds

**Missing medication** Required medication is not on the trolley, resulting in the nurse abandoning the round to retrieve it from the medicine cupboard.

**Noise** Environmental noise that results in the nurse being visibly distracted or interrupted from the task of administering medication.

**Telephone** Nurse is distracted by a ringing telephone or abandoning the rounds to answer it.

**Emergency** Occurrence in an emergency situation like cardiac arrest, visibly distracting the nurse or requiring the nurse administering medications to abandon the rounds. **Other** Miscellaneous interruption and distraction not assignable to any of the above categories.



## Appendix 3- Audit - Administration of medication

Name of Unit\_\_\_\_\_

Audit performed by\_\_\_\_\_

Date: \_\_\_\_\_

Please print name\_\_\_\_\_

### Drug Round (Observation)

–

#### Drug round:

1. Does the nurse prepare the drug trolley with the necessary equipment for the drug round (e.g. Pill crusher per resident as is required, single use containers /spoons, note pad, pen, and water etc.	Yes	No	N/A
2 Is there a copy of the BNF on the drugs trolley?			
3 Did the nurse decontaminate her/his hands before commencing the drug round?			
4 Did the nurse decontaminate her/his hands between residents?			
5 Did the nurse check that there is a valid, clear prescription for each drug on the medication administration record signed by the prescribing doctor			
6 Did the nurse check the medication administration record that the resident's name, date of birth and RMN number are clearly written on each page and where there is a photograph attached that this is a true likeness of the resident?			
7 Has the nurse knowledge of the therapeutic use of each drug, its normal dosage, side effects, precautions and contraindications?			

8 Did the nurse check if the resident has any known allergies?			
9 Did the nurse check the prescribed time each drug is to be administered?			
10 Did the nurse check when the drug was last administered			
11 Are prescribed medicines administered as close as possible to the time written on the prescription (only a delay of one hour is acceptable)?			
12 Did the nurse check the prescribed dose of each drug?			
13 Did the nurse check the prescribed route and form of each drug?			
14 Did the nurse check the specific instructions regarding administration of certain drugs are adhered to e.g. If drugs are best taken on an empty stomach?			
15 Did the nurse select the appropriate drug from the drug trolley, read the name and strength of the drug on container/ box?			
16 Did the nurse check the expiry date of the drug?			
17 Did the nurse use single use medicine pots, and spoons to avoid making contact with the drug?			
18 Where medicines needed to be crushed, did the nurse establish that these were sanctioned by a medical practitioner?			
19 Was an individual clean pill crusher used for each resident?			
20 Did the nurse double check the drug name and dosage with the prescription sheet and measure or count out the correct dose prior to administering?			
21 Did the nurse verify the resident's identity prior to administering medication?			
22 Did the nurse communicate information sensitively to the			

resident prior to and during administration of medication?			
23 Were all medicines administered personally by the dispensing nurse immediately following preparation?			
24 Did the nurse stay with the resident until the drug has been swallowed?			
25 Did the nurse remove medicines if the resident was unavailable or unable to take them .			
26 If the drug was delayed, refused or omitted did the nurse document the reason for this, using the appropriate coding detailed on the medication administration record/prescription sheet?			
27 Was any delay or omission documented in the narrative notes and reported to the medical practitioner?			
28 If a medication was signed for but not given did the nurse put one line through the mistake and initials the mistake?			
29 Did the nurse leave the medicine trolley unattended during the course of the medicine round or when unlocked?			
30 Was the nurse interrupted during the drug round?  (If yes please specify the number of times in the comments box below)			
Total	30	30	

#### Appendix 4 – QUESTIONNAIRE for Nurses

##### Survey of nurses' satisfaction with the use of drug round tabard and medication administration checklist.

This questionnaire measures the nurses' satisfaction with the use of drug round tabard and medication administration checklist with regards to safety, compliance and efficiency. Therefore, please answer the questions honestly. It is completely confidential and your participation is imperative to the success of this survey. It should take around 5 minutes to complete.

Thank you for your co-operation.

Please rate your agreement with the following satisfaction statements;

ITEMS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(1) The use of medication administration checklist serve as a reminder to adequately prepare for a smooth drug round.					
(2) The use of drug round tabard is effective in reducing interruptions thereby preventing medication administration errors.					
(3) The use of drug round tabard helps me to be focused and concentrate on medication administration.					
(4) The use of drug round tabard and medication administration checklist makes it easy to comply with the hospital's medication administration policy (e.g. the "5" rights, hand hygiene etc.)					
(5) The use of drug round tabard and medication administration checklist helps in faster completion of medication rounds.					
(6) The use of drug round tabard makes me feel protected and supported by other members of staff.					
(7) The use of drug round tabard and medication administration checklist helps me to be efficient at medication administration.					
(8) The use of drug round tabards during medication facilitates proper documentation.					

Thank you for taking time to complete this questionnaire.

## Appendix 5 - Types and Definitions of Medication Administration Errors

Type	Definition
Omission Error	The failure to administer an ordered dose to a patient before the next scheduled dose, if any. (Without documenting reason in the appropriate records).
Wrong Dose Error	Administration to the patient of a dose that is greater than or less than the amount ordered by the prescriber or administration of duplicate doses to the patient.
Wrong Form Error	Administering medication in a different form than prescribed (e.g. Crushing Tablet).
Wrong Resident	Administering medication to a resident for whom it is not prescribed.
Wrong Route	Administering medication via the route different from the route prescribed.
Wrong Time	Administration of medication outside a predefined time interval from its scheduled administration time (more than 60 minutes before or after the prescribed time).